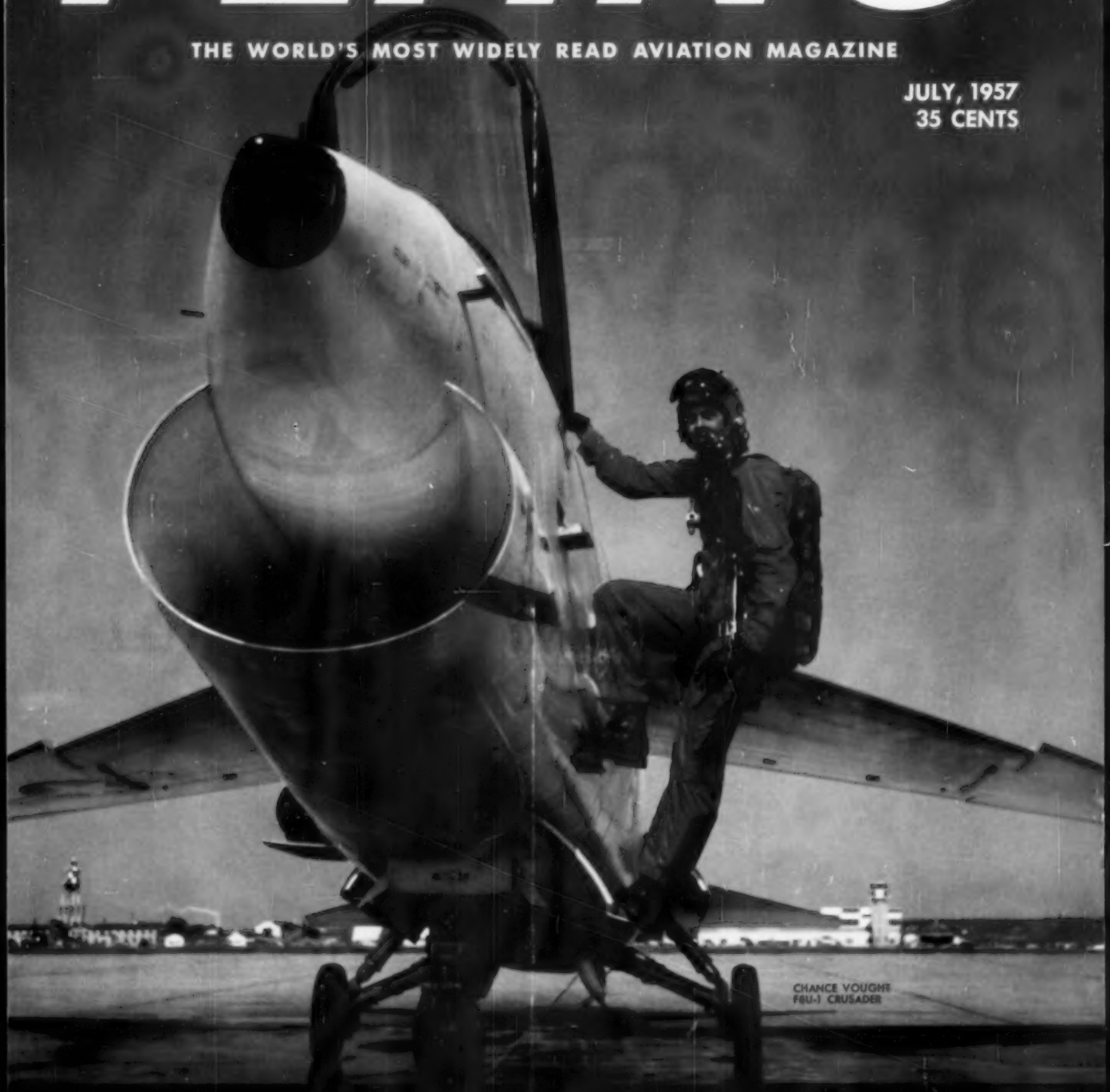
FIGHTING THE GUATEMALAN REDS

FLYING

THE WORLD'S MOST WIDELY READ AVIATION MAGAZINE

JULY, 1957
35 CENTS



CHANCE VOUGHT
F8U-1 CRUSADER

ADVICE TO FLYING FATHERS
WHEN MOPPETS AND AIRPLANES TANGLE.

CHECK PILOT REPORT:
BEECHCRAFT H35 BONANZA

Scott
FOR SAFETY—FOR SERVICE

OXYGEN SYSTEMS for

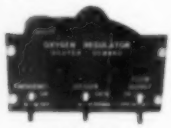
New Jet Transport Aircraft

Emergency Passenger Oxygen System and Stewardess Pak

10260 Oxygen Regulator

5120 Universal Oxygen Outlet

Automatic Oxygen Trigger Valve



10400 Diluter-Demand Miniature Panel Regulator

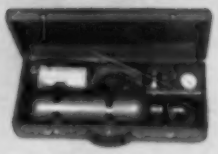
10700 Slow-Opening Cylinder Valve

Scottoramic Mask with vision unlimited

Above items are but a few in the Scott Line of Oxygen Systems for the Jet Transport Aircraft. Write for more complete information.

Airline and Executive Aircraft

Scott Oxygen Console for 5



AVIOX "Oxygen for 4" in a quality leather carrying case.

Scottoramic Mask optional on all Scott protective breathing equipment.

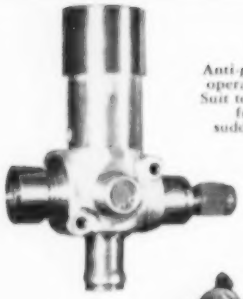
Low-cost, lightweight, Fixed Oxygen System.

5600 Dual Purpose Oxygen Equipment. Used on major airlines and large executive aircraft. Demand Regulator for Crew, Constant flow for passengers.

PLUS

Equipment for small aircraft; Tail wheel assemblies, Control Wheels, Brake Units, Parking Brake valves, Air and Temperature Gauges.

Military High Altitude Aircraft



Anti-gravity "G" Valve operates "G" Pressure Suit to protect jet pilots from effects of sudden acceleration.

A-21 Portable Positive Pressure Demand Unit

Oxygen and Pressure Suit Test Console

Look to Scott for the newest and best in high altitude equipment. Many Scott items now in the design stage will be the standards of tomorrow.

Completely Integrated Survival Kits for high altitude breathing protection and survival after ejection.

SINCE 1932
Scott
FOR SAFETY—FOR SERVICE

SCOTT AVIATION CORP.
224 ERIE STREET, LANCASTER, N. Y.
Export: Southern Oxygen Co., 16 West 57th Street, New York 19, New York
West Coast Office: Fulton-Ventura Bldg., 12373 Ventura Blvd., Studio City, Calif.

And a mighty good sign it is.

It identifies each branch in a magnificent network of Goodyear airport dealers and distributors who supply civil aviation needs throughout the nation.

Wherever you fly, look for this familiar emblem. It promises many welcome and reassuring things to the air-minded businessman. Things like top-quality aircraft parts and accessories. Swift, efficient, low-cost service. Fair play and expert workmanship.

In short, it's a sign that more and more flying folk have come to rely on. That's why you'll find it — and the service it represents — in a steadily growing number of airports from coast to coast.

So whether you need a minor repair or a complete overhaul, taxi over to the "Sign of Service." You'll find out mighty soon—here is a reputation richly earned.

Goodyear, Aviation Products Division,
Akron 16, Ohio, and Los Angeles 54, California

More Aircraft Land on Goodyear Tires, Wheels and Brakes Than on Any Other Kind

JULY, 1957 VOLUME 61, NUMBER 1

FLYING

Reg. U. S. Pat. Off.

WILLIAM B. ZIFF (1898-1953) FOUNDER

GILL ROBB WILSON
Editor and Publisher

C. L. HAMILTON
Managing Editor

ALEX DAWYDOFF
Assistant Managing Editor

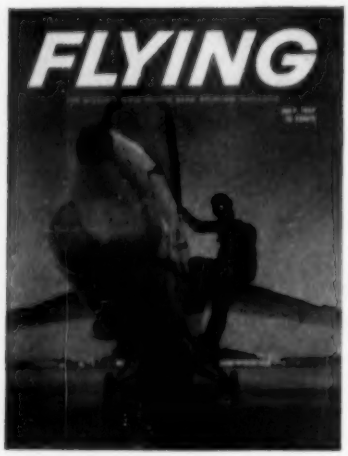
MARJORIE M. GRAY
Associate Editor

NOVETAH DAVENPORT
Associate Editor

A. M. COURTNEY
Editorial Assistant

FIL GIULIANO
Art Director

ROBERT B. PARKE
Advertising Manager



THE COVER: Navy's first 1,000 mph. carrier-borne fighter, the Chance Vought F8U-1 Crusader. For details, see page 39

CONTENTS

The Welding Power of Air Commerce, *An Editorial* 22
150 Years of Maps . . . . . *Neal H. Duncan* 25
Messenger to Australia . . . . . *Nancy Ellis Leebold* 28
Eating—a Problem at Altitude . . . . . *Ben Pearse* 31
The Airman's World 32
Check Pilot Report on the Beechcraft H35 Bonanza . . . . . *Norman Jacobshagen* 34
Cuban Air Cruise . . . . . *Hans Groenhoff* 36
Chance Vought F8U-1 Crusader 39
Port of Perfection . . . . . *Beth Thomas* 40
The Garrett Story . . . . . *Joseph Volney* 42
Advice to Flying Fathers . . . . . *Hugh Dorworth* 44
Flight Briefing for the Businessman . . . . . *Emmett Robinson and Ed White* 46
Home Folks on Guard . . . . . *Bob Finney* 47
Avoid Mid-air Collisions . . . . . *Elston H. Swanson* 49
"Sulfato" Nemesis of Guatemalan Reds . . . . *Douglas Larsen* 50
Golden Rule Airport . . . . . *Ruth and Don Downie* 54
Learn Before You Weep . . . . . *Ben Preece* 55
Space Pioneers . . . . . *Lisande LaCoste* 57
I Learned About Flying From That! No. 209 . . . . . *Robert F. Sullivan* 58

FLYING FEATURES

Mailbox 6
Briefings 10
Have You Read? 14
Hangar Flying 20
Have You Seen? 52
Overnight Stop—No. 27 62
AOPA News 82
Flying Calendar 90
Photo Credits 94
Advertising Index 97

Member of the Audit Bureau of Circulations

Ziff-Davis Publishing Company Editorial and Executive Offices
366 Madison Ave., New York 17, N. Y.
Branch Offices: 64 E. Lake St., Chicago, Ill.
Room 412, 215 West 7th Street, Los Angeles 14, California

ZIFF-DAVIS PUBLISHING CO., 366 Madison Ave., New York 17, N. Y. B. G. Davis, President; William Ziff, Administrative Vice President; H. J. Morgenroth, Vice President; Michael H. Froelich, Vice President; Michael Michaelson, Vice President and Circulation Director; George Carney, Secretary-Treasurer; Albert Green, Art Director.

SUBSCRIPTION SERVICE: All subscription correspondence should be addressed to Circulation Dept., 64 E. Lake Street, Chicago 1, Ill. Please allow at least 4 weeks for change of address. Include your old address as well as new—enclosing if possible an address label from a recent issue of this magazine.

CONTRIBUTIONS: Contributors are advised to retain a copy of their manuscripts and illustrations. Contributions should be mailed to the New York Editorial Office and must be accompanied by return postage. Contributions will be handled with reasonable care; but this magazine assumes no responsibility for their safety. Any copy accepted is subject to whatever adaptations and revisions are necessary to meet the requirements of this publication. Payment covers all author's, contributor's and contestant's rights, title, and interest in and to the material accepted and will be made at our current rates upon acceptance. All photos and drawings will be considered as part of the material purchased.

FLYING is published monthly by the Ziff-Davis Publishing Company. William B. Ziff, chairman of the Board (1946-1953), at 64 E. Lake St. Chicago 1, Illinois. Entered as second-class matter Sept. 8, 1942, at the Post Office, Chicago, Ill., under the act of March 3, 1879. Authorized by Post Office Department, Ottawa, Canada, as second class matter.

SUBSCRIPTION RATES: One year U. S. and possessions, and Canada $4.00; Pan American Union Countries $4.50, all other foreign countries $5.00.

Copyright © 1957 by Ziff-Davis Publishing Company. All rights reserved.

PLANE FAX

by STANDARD OIL COMPANY OF CALIFORNIA

Air-to-ground "talk" speeds mountain rescue

Lost in the high forests of Southwest Utah with cold and darkness closing in! It looked like an unpleasant night ahead for a mother and her four young children who had strayed from their party. Then state police called Royce Knight for help. In less than two hours he combed a hundred square miles of rough country, spotted the lost family's campfire, and led the ground party to them by walkie-talkie!

"Low-level night flying isn't much fun," says Mr. Knight, "but it's not too bad when you're sure of your engine. I can count on full power every minute I'm in the air, with Chevron Aviation Gasoline. It never fouls plugs, gives me extra power when I need it, and still lets me lean back for economy at cruising speed.

"Flying out of Cedar City, I do a lot of crop dusting and spraying — the kind of work that's toughest on an engine. I make sure my planes stay in top shape by using RPM Aviation Oils. I'm getting 200 extra flying hours between overhauls since I switched to 'RPM.' Parts stay clean and free, valves never stick, bearings are perfect."

TIP OF THE MONTH

When flying on the lee side of a mountain crest or ridge, remember that downdrafts will make your altimeter read "high." It's possible to be in a steady descent and still get "constant altitude" readings.

We take better care of your plane

CHEVRON AVIATION GASOLINE

AVIATION OILS RPM

T.M.'S "RPM," "CHEVRON," "PLANE FAX," REG. U. S. PAT. OFF.

RULETO

SPECIALISTS in CAA-PMA approved CONVERSIONS

When you convert your airplane—you'll expect 2 things —*safety & top-flight design.* Ruleto Conversions are built to rigid engineering standards from *new material* by top craftsmen. Rigorous testing and inspection make Ruleto Conversions your wisest choice for outstanding performance and safety.

Ruleto Aeronautical & Electro-Mechanical Engineering facilities and personnel will solve your design, development and production problems—from a component to a complete system!

RULETO CONVERSIONS

Ercoupe Series
METAL WING CONVERSION KIT
Swift Airplane
LANDING GEAR & FLAP HYDRAULIC CONVERSION
Cessna 120—140—170
METAL WING CONVERSION KIT
Stinson 108 Series
STINSON METAL FUSELAGE KIT
FIBER GLASS NOSE COWL

Write today!

RULETO
INDUSTRIES, INC.
4823
Rosecrans Ave
Hawthorne
Calif.

Remember It's RULETO for CAA-PMA Approved Conversions

MAILBOX

NEW APPROACH TO INSTRUMENT RATING

Congratulations to Alice Fuchs whose article "New Approach to Instrument Rating" (May issue) has long needed writing.

The private pilot and even some operators have long been hamstrung by the aura surrounding instrument flight. The services long ago discarded the needle-ball approach . . . , but it has taken the CAA and hence general aviation some time to come around.

The modern method of training can be closely compared to contact flight training. It takes approximately the same number of hours to reach a given level of proficiency in most maneuvers. Student aptitude in contact seems to indicate aptitude for instruments.

So you young would-be pro's read the article again and go out and get that ticket. It's a ticket to a better career for you in aviation. And you old amateurs, do the same. It's life insurance that can't be bought, as well as better utilization for your aircraft. Whoever you are, make sure you are getting the "New Look" in instrument training.

S. C. PETERSON, JR.
Instrument Section
University of Illinois
Urbana, Ill.

SENTINELS OF THE OPEN SKY

As a former member of the 66th Tactical Reconnaissance Wing I want to commend FLYING for printing the article "Sentinels of the Open Sky" in the May issue.

The average American does not realize the importance of tactical reconnaissance in the defense of our country. It is about time some recognition was given the various tactical reconnaissance units of the USAF. I feel the editors of FLYING realized this fact when the article was published. With the help of such articles the American people will give due credit.

GENE TREVATHAN
Gleason, Tenn.

AIRMAN'S WORLD

I am immensely interested in your "Airman's World" and the attractive manner by which you illustrate your lines. The photograph of the Chief Head-Hunter on pages 32 and 33 of your March number is simply fascinating. . . .

P. A. VANDEWERVE
Editorial Secretary
"The Flying Dutchman"
Official Publication
Royal Netherlands Air Force
The Hague, Holland.

I have been reading your magazine every month for the last year. . . . (It was) the Airman's World section that got me interested in flying and is the only thing I can do to get some relaxation.

Driving a truck all week in heavy traffic and rush hours gets pretty nerve racking. A couple of quiet hours flying on weekends is about the only thing that keeps me from going crazy. . . . I think it's about time your fine article got some credit.

BILL WEATHERSTONE
Sarnia, Ont.

MODIFICATION PROJECT

Your readers may be interested in a couple of pictures of modifications to a Luscombe 8E (above) and Cessna 140 (below).

I built the mount and all special parts and modified the cowlings to accommodate the 115 Lycoming for the 140 and the Luscombe has had a series of engines in

it, first a 65 hp Continental, then an 85, the 115, the 125 and now a 150.

These increases in horsepower have added greatly to the speed, performance and stability of the airplanes. After considerable effort, I have obtained CAA Certification on both airplanes. I might say that this has been quite a project, but I believe they are well worth the expense.

LELAND DEJEAN
Springfield, Ore.

NAVY OBLIGES

After reading "Brother Under the Skin" (April issue) I thought I would drop a line to the "Mailbox." We hear and read so much about jets and military planes and the bad side of the story, I would like to relate an experience that happened to me on March 22 last.

While in flight to Patrick Henry Air-

(Continued on page 8)

FLY MAGNETIC HEADING AUTOMATICALLY

Cessna owners . . . Piper Tri-Pacer owners . . . you may now fly your heading automatically with the brand new Globe Mark II autopilot. On even the most grueling cross-country flights you can reduce mental and physical pressure. And you needn't be a millionaire to afford it.

Globe Mark II is the first autopilot to use a precision built **magnetic** compass to directly control heading. Globe engineers designed it especially for this application. We thought of using a conventional directional gyro, but its drift characteristics would have made the autopilot somewhat less than "automatic" for holding a heading. When we avoided the temptation to use a vacuum system or existing instrumentation, our engineers thoughtfully provided, in effect, "dual instruments" in the Mark II.

At the bottom of a long technical discussion is the fact that Mark II is essentially a pilot-proved Globe Gyro/Stabilizer, which provides spiral stability, short term heading sense, and controlled, stable turns—PLUS—long term Heading/Lock, heading memory, and an extremely accurate panel mounted remote compass indicator if you want it.

Get your hopes up—you can get one. Without obligation we will arrange a demonstration flight for you. Conservatism dictates, however, that you first study an illustrated brochure we've prepared for you. The complete Mark II costs $1350, or $725 if you already own a G/S. Gyro/Stabilizers alone will always be available, now at $675.

With this handsome console on your control wheel hub you can hold your heading automatically until the gas runs out. Function switch places the Mark II on Standby, Gyro/Stabilizer, or Heading/Lock. Toggle switch trims heading left or right. Trim-Turn knob is for trimming short term heading or for making stable turns with the G/S.

GLOBE MARK II

SPECIAL PRODUCTS DIVISION, GLOBE INDUSTRIES, INC., 125 SUNRISE PLACE, DAYTON 7, OHIO

Complete "Flying Farmer" Runway Lighting Package

Everything you need for 2000-foot landing strip, runway, or taxiway $600

Includes 18 stake-mounted runway units with clear lens; 12 threshold units with green lens; yellow cones, lenses, lamps, control switch, Penta-treated stakes, 10,000 feet plastic-covered No. 10 copper wire for direct burial.

Now you can make safer landings in darkness, dust, or fog with a dependable, electric-lighted runway system that costs only 30¢ per runway foot for materials.

Install it yourself. Just plow 6-inch furrows for cable, drive stakes for the units, hook up to regular 115-volt AC power. Needs no transformers. Lamps are 15 watt (105 lumens), giving 27 cp output.

This is a highly effective system, made by the makers of the famous Thermal Beam (TM) high-intensity lights for larger airports.

Also available: "Flying Farmer" kits for 2500- and 3000-foot runways. Mail coupon for complete information.

LINE MATERIAL

Airport Lighting

(McGraw-Edison Company)

MAIL THIS COUPON

LINE MATERIAL INDUSTRIES 152
Milwaukee 1, Wisconsin F-77

Please send me free folder on "Flying Farmer" runway lighting packages.

Name.....

Business.....

Address or Route.....

Town.....*State*.....

MAILBOX

(Continued from page 6)

port at Hampton, Va., from New Jersey, with two passengers, I ran into foul weather at Baltimore. Thinking it only haze and smoke we went ahead. On the other side of Baltimore it was just as bad. . . . Down to 1,200 feet, I started looking and found two sod fields knee-deep in water near Patuxent Naval Air Base. There was only one place to go—Patuxent. I could not get them on my Low Frequency so joined the pattern, received a green light and landed. I was guided to the VIP ramp, and was treated like a king, asked if I needed gas, and given helpful advice. . . . If all military stations are like Patuxent NAS, you need never worry; but let's not overdo it—make sure you need help first.

WILLIAM GOFORTH

Wharton, N. J.

WHITHER THE MOTH?

I, too, read Peter Bowers "Daddy What's A Biplane" (January issue) and failed to see my first love, a Moth biplane. I owned Moth NC 138M which I purchased in November 1940 from Preston Smithers of Philadelphia. It was based at Pitcairn Field at the time

I spent many happy hours flying this

85 Gypsy-powered open cockpit biplane out of old Lancaster, Pa. airport . . . and have wondered many times if this or other Gypsy or Tiger Moths are licensed and flying today? Enclosed is a photo of my old plane.

JOHN HENRY HESS

Manheim, Pa.

PROBLEM OF FINANCE

My hat's off to you for putting out the nation's greatest magazine on aviation.

However, I have a different sort of problem. I am a Protestant Minister, and in the course of my activities, find it necessary to fly quite a bit. I do not own a plane, although I have several good offers from people who have planes that would be suitable for local flying. But as you might well suspect, the financial reimbursement for one of my calling is not sufficient to merit paying cash for one of these planes even though they are less than $1,000 in cost.

My request is this: inasmuch as local finance companies and banks do not make it a practice of giving loans for the purchase of aircraft, can you direct me to some firm that would finance the purchase . . . over a substantial length of time?

REV. CHARLES G. HINSON

Lakeland, Fla.

● *Should any reader have some concrete information on this subject the Rev. Hinson would be most grateful to receive it direct, and* FLYING *would like to receive the information too in order that it may be passed along to other readers who have a like problem.*—ED.

FLYING CLUBS

Here is another flying club report that will be at least one more addition to your list of active clubs.

We are the Cloudbuster's Flying Club, based at the El Paso (Tex.) International Airport. In existence for over a year, the membership stands at eighteen and we are flying a Funk and a Piper J-5. Originally the entrance fee was $100, of which $85 was refundable when a member left the club; dues were $5 per month and solo time $2 per hour. Finding these rates inadequate to maintain the aircraft, we have changed to a non-refundable $30 entrance fee and $3 per hour solo time. Even these rates are not adequate . . . but our main purpose is to provide low-cost flight instruction for military personnel stationed here at Fort Bliss. The airport, a little hectic at times for new students, does have the advantage of good practice in radio procedure and traffic patterns which students on small, traffic-free, fields do not enjoy.

We read your excellent magazine every month and hope we are doing our bit to train safe, well rounded pilots to strengthen the ranks of private aviation.

1/LT. LESTER H. ECK
President

Fort Bliss, Texas

As a member of the small but popular Pittsburgh (Pa.) Flying Club (PFC, for short) I thought a mention in your "Mailbox" would be of interest.

We have been in operation about 18 months and are still growing. We have two Piper J-3's and 23 members, have turned out four private pilots, and the rest potentials in a few hours. All started from scratch.

Entrance fee is $100, dues $6 per month. Ground school is held once a week, free of charge and the club also pays for basic navigation instruments and the first eight hours of dual. Beat that if you can! But that's not all, we also return $50 of the entrance fee if a member drops out.

We may not fly Cessna's or Pacer's, but we sure have one heck of a good time flying our good ol' J-3's.

WAYNE K. LIVINGSTON
Secretary

Pitsburgh 10, Pa.

BEECHCRAFT TRAVEL AIR ILLUSTRATED

SR-83P ILLUSTRATED

Beechcraft specifies AC SR-83P *platinum electrode* Spark Plugs for its all-new, all-metal, four-place Travel Air. Powered by twin 180-hp Lycoming engines, this high-performance private plane is designed to cruise at 200 mph!

AC *platinum electrodes* are designed for peak performance in all types of flying! They have the highest anti-fouling characteristics to minimize costly "ignition delays." They provide smoother idling and high heat conduction to prevent pre-ignition, and they're less susceptible to lead fouling.

AC Aircraft Spark Plugs have been proved in millions of hours of flight in airline and military planes. You'll find them best for the planes you fly!

GM GENERAL MOTORS

AC

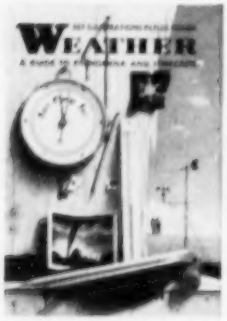
AIRCRAFT SPARK PLUGS

AC SPARK PLUG THE ELECTRONICS DIVISION OF GENERAL MOTORS, FLINT, MICHIGAN

DISTRIBUTED BY: Airwork Corporation: Millville, New Jersey; Miami Springs, Florida; Newark, New Jersey; Atlanta, Georgia; Alexandria, Virginia; Cleveland, Ohio. **Pacific Airmotive Corporation:** Burbank, California; Seattle, Washington; Oakland, California; Kansas City, Kansas; Denver, Colorado; Linden, New Jersey. **Southwest Airmotive Company:** Dallas, Texas; Kansas City, Kansas; Denver, Colorado. **Standard Aero Engine Ltd.:** Winnipeg, Manitoba; Vancouver, B.C.; Edmonton, Alberta. **Van Dusen Aircraft Supplies, Inc.:** Chicago, Illinois; Minneapolis, Minnesota; Teterboro, New Jersey; East Boston, Massachusetts; Alexandria, Virginia.

Briefings . . .

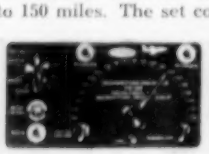
AN ENCYCLOPEDIC amount of weather information is to be found in this pocket-size book entitled "Weather". Illustrated with several hundred accurate pictures and diagrams in color, the book is the work of Paul E. Lehr, Senior Meteorologist, USAF Weather Central, R. Will Burnett, Professor of Science Education and Professor of Education Herbert S. Zim, both of the University of Illinois. Illustrations by Harry McNaught. Price $1.95. Simon and Schuster, New York.



OPERATING WITHOUT magnetic compass, radio or radar and without a glimpse of the earth, sun or stars, a new invention called "Inertial Guidance" has been developed which is said to be capable of guiding any craft or missile to any specified spot on earth, free from enemy interference. M.I.T. and Minneapolis-Honeywell Regulator Company, both of which have the equipment in flight test stage, say that the heart of such navigating systems is a completely free-floating gyroscope.

REVISED Civil Air Regulations have given CAA the power to designate high-density air traffic zones at key areas in the U. S. and to limit aircraft speeds to 180 mph within these areas. Effective last March 15, the new rules also require radio equipped aircraft to communicate with ATC before operating to or from airports within high-density zones. Aircraft without radio may fly in the zones only with prior control tower permission.

LOW PRICED and developed for private plane owners, Nova-Tech, Inc., Manhattan Beach, Calif., has introduced the TR-102, a new VHF two-way Air-O-Ear Transmitter-Receiver with a range of 50 to 150 miles. The set consists of 10 channel VHF transmitter; tunable VHF receiver (108 to 128 mc); built-in-modulator; power supply. Ignition suppressor which permits operation with unshielded ignition systems is a feature as is a noise squelch control; front panel modulation indicator for transmitter; plug-in for Omni; two head jacks. Complete, ready to operate with antenna and two high-power crystals, $150.



NINE BRIGHT NEW Beechcraft H35 Bonanzas in one day—April 15—were flown from the Beech Aircraft plant at Wichita to customers scattered in seven states. They represented around $235,000 for the day's sales total. Owners of the new planes range from a Texas manufacturer who has flown for 27 years, to the president of a North Carolina rendering concern who has just learned to fly. Two H35's went to Nebraska and others to Delaware, Ohio, Iowa and Oregon.

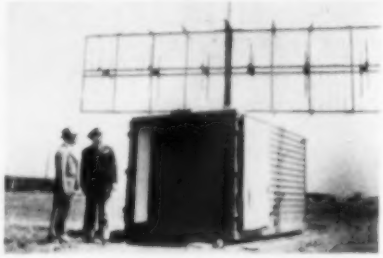
SINCE CAA APPROVAL has been granted for the application of fiber glass to fabric covered airplanes, White-Hall Pacific Aviation, Inc., at Oxnard, Calif., plans early distribution of a kit which A & E mechanics, fixed-base operators and agricultural pilots may use.

DURING A RECENT VISIT to Ethiopia, our traveling vice president, Richard M. Nixon was presented with an Ethiopian Airlines' Convair model by H. E. Dedjazmatch Zewde Gabresellassie, president of the line. During the presentation at the Addis Ababa airport, Mr. Nixon gave high praise to the Ethiopian Airlines for its 11 years of successful operation and its contribution to making the 3,000-year-old Empire accessible to the rest of the world. With the Vice President was U. S. Ambassador to Ethiopia Joseph Simonson seen in background (with dark glasses).

A ONE-MAN OPERATION, with one aircraft when it began operation in Anchorage, Alaska on April 10, 1932, Pacific Northern Airlines, originally known as Woodley Airways, has reached a quarter of a century of service to Alaska—without a casualty. Founded by A. G. Woodley, now the line's chief executive, the first year of operation recorded a total of 53 passengers, 21 mail ton-miles and 128 cargo ton-miles flown. Today the airline employs 550 persons at an annual payroll in excess of $3,500,000.

RE-ENTERING THE COMMERCIAL FIELD after an absence of seven years, Canadair Ltd., Montreal subsidiary of General Dynamics, is offering a new version of the English Bristol Britannia Turboprop airliner to airlines. Known as the CL-44, the plane will be powered by four Bristol Orion turbo-prop engines and is to be offered in airliner, freighter and military transport configurations.

HOUSED IN THIS METAL BOX under a revolving "bedspring," Air Associates' "Talking Beacon" may soon become a real boon to every pilot with only a VHF receiver and a compass in his plane. Tuned into the beacon, at any point of the compass, the pilot hears a feminine voice broadcasting his headings at 15-second intervals. Sponsored by the Signal Corps, this first production model, prior to shipment to the Army Electronics Proving Ground, Fort Huachuca, Ariz., passed two weeks in successful civil flight demonstrations at Teterboro Airport, N. J. Col. Eric Osborne (right), Signal Corps project officer, discusses the system with F. W. Goodsey, Jr. president of Air Associates.



BLUE GRASS AIRMOTIVE INC., Lexington, Ky., is Beech Aircraft's new distributor for most of Tennessee and Kentucky. Members of the Blue Grass dealership network at present include Central American Airways, Louisville, Ky.; Cherokee Aviation, Knoxville, Tenn.; Executive Aircraft, Chattanooga and Blue Grass Airmotive of Nashville.

NEWARK AIR SERVICES has completed its move of all service and maintenance facilities into its new $600,000 hangar at Newark Airport. New facilities, which now enable the company to handle any size plane up to a DC-6, include a pilot center, conference rooms for transit executives, a club lounge and restaurant.

A FLYING PHYSICIAN recently became the owner of Piper Aircraft's 1,000th twin-engine Apache. Delivery was made on April 26th to Dr. and Mrs. Thomas J. Gamble of Encino, Calif. J. W. Miller (left) Piper Sales Manager, bids the new owners good luck as they take off for the flight home. Currently produced at the rate of two per day the Apache first went into production three years ago.

USING SUPERCHARGED All-Weather Executive twin-engine Aero Commanders, a new airline, Aero Transportes Litoral Argentino, has started an inter-

(Continued on page 98)

FLY WEATHER-WISE

These weather items prepared in consultation with the United States Weather Bureau

WEATHER AND RADIO

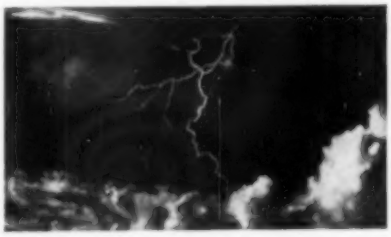
HOW WEATHER CONDITIONS AFFECT THE PROPAGATION OF RADIO WAVES

RADIO RECEPTION may vary from poor to exceptional, depending on the temperature stratification. Temperature inversions alter refraction characteristics of the atmosphere. This can result in freak reception over great distances on VHF channels.

Precipitation static—ice crystals, snow flakes and rain droplets striking aircraft can cause crackling in headphones.

Static due to lightning discharges. These occasional bursts and crashes can be picked up at considerable distance. It is often your first indication of thunderstorm activity.

How to minimize static: Change altitude if it can be done safely. Decrease speed in rain or snow storms. Where possible, avoid dry snow and cirrus clouds composed of ice crystals. Keep radio volume turned low to reduce background noise. It is preferable to use a higher frequency broadcast station for ADF homing instead of low frequency range station. During periods of static, push headphones over temples when not listening—to keep fatigue to minimum.



Aurora Borealis, associated with magnetic storms. These extra-terrestrial phenomena cause communication fadeouts. Tune in to Time Signal Broadcasts of National Bureau of Standards (5 or 10,000 kilocycles for forecasts of periods of poor reception).

NEW MOBILGREASE AERO LO-TEMP

For improved performance, added protection and reduced maintenance of grease lubricated parts—*including instruments, where protection from corrosion and minimum frictional drag are particularly important*—specify Mobilgrease Aero Lo-Temp.

For Top Flight Performance—Make it **Mobil**

Leader in Lubrication for 91 years

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM CO. GENERAL PETROLEUM CORP., MOBIL OVERSEAS OIL CO., INC.

BEST ALL-ROUND STABILITY IN ITS CLASS!

...with Land-O-Matic* landing gear...tapered high wing... 57 other exclusive features in the big new '57 Cessna 172

*the feature that's revolutionizing flying.

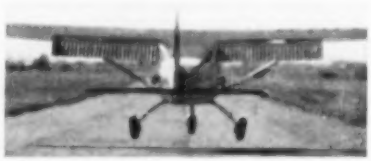
More and more pilots are proving it: the big Cessna 172 is easier, more stable and comfortable to fly . . . does have dozens of extra features not found in any other low-priced plane! That's why it quickly became the largest-selling airplane!

From its smooth 145-H.P. 6-cylinder Continental engine, world record holder for endurance flight . . . through its larger, more-handsomely appointed cabin . . . to its Land-O-Matic landing gear that shrugs off shocks from short, rough landings and take-offs . . . here is an airplane so far ahead of its class you must see and fly it yourself to fully appreciate its value! And a Cessna 172 (with std. equip.) is priced at just $8,975 . . . f.a.f. Wichita.

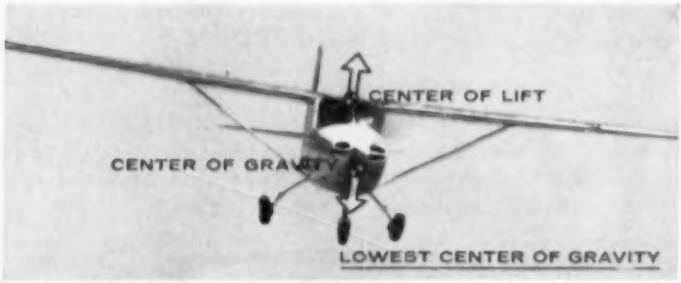
So get proof—in flight today from your nearby Cessna dealer (Yellow Pages of phone book) or write: CESSNA AIRCRAFT CO., DEPT. F-8, Wichita, Kans.

Inquire about Cessna lease plans

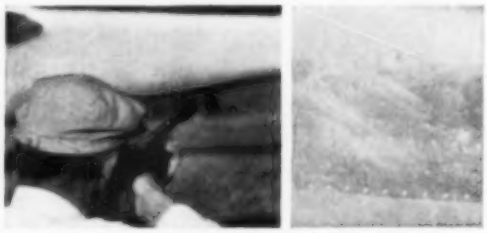
Cessna



MOST FLAP IN ITS CLASS! Cessna's 120%-larger Para-Lift flaps give shorter take-off runs, slower and smoother approaches, actually float you down twice as gently as a man in a parachute. And they're exclusive to the Cessna 172 in the low-priced field.

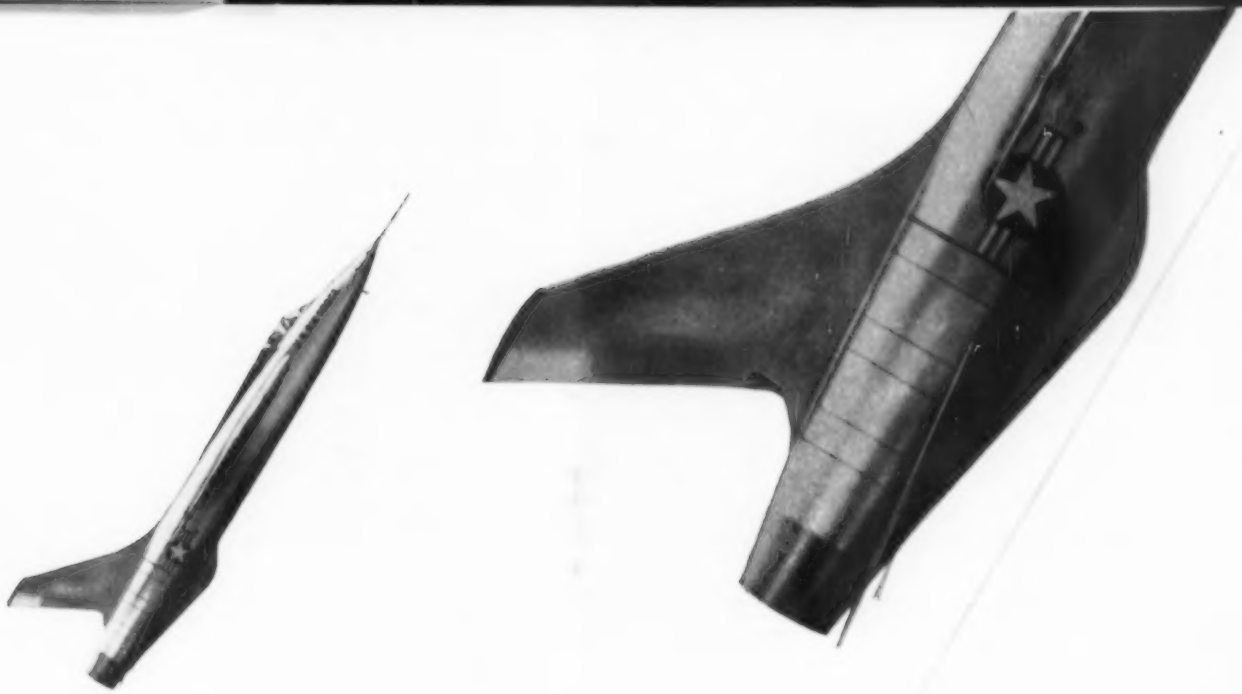


TRUE HIGH-WING STABILITY with a bigger, high-lift wing and a lower center of gravity than any other plane in the low-priced field! You do less trimming, compensating in flight—enjoy a "big-plane feel."



RUGGED ALL-METAL CONSTRUCTION. It's even shotgun-tough, as shown in these unretouched photos! Stays just as tough after years of service! And the Cessna 172 is the only all-metal airplane priced so low. Inside, too, you find quality through and through—newly designed luxury interiors for '57, far more baggage capacity, and the fullest windshield visibility in its class.

4 GREAT CESSNAS 172 180 182 310 THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED



NOW YOU SEE IT · · NOW YOU DON'T

THE F-105

Furious speed . . . smashing primal power . . . overwhelming persuader for peace, this new Thundercraft*, more than any other . . . is designed to deliver Tactical Air Command's composite air strikeforce knockout punch at any target, any time!

*Latest in the line . . . The THUNDERCHIEF

REPUBLIC AVIATION

FARMINGDALE, LONG ISLAND, N. Y.

Designers and Builders of the Incomparable **THUNDER-CRAFT**

Make Your Plane "SMILE" Again!

Like that, you can Do-It-Yourself . . . giving your plane a spanking, brand-new appearance. AIRTEX's superior interior replacement equipment is easily installed! No fuss, no know-how needed . . . and you get a *perfect fit* every time! You'll save money and time and increase the value of your plane.

Order Direct Today!

AIRTEX FOAM SEAT CUSHIONS

Rugged—Comfortable—Beautiful!
Guaranteed *superior* to original, up to six pounds *lighter*, these heavy-duty leatherette fabric covered SEAT CUSHIONS are *complete* replacement sets for *all* seats including back-rests and bottoms.

Aeronca 7AC—Champ	$22.50
Aeronca Chief (State Yr. of mfg.)	23.25
Cessna 120-140	32.50
Ercoupe	33.25
Luscombe 8A—8E	33.75
Piper J-3, PA-11, PA-18	21.50
Piper J-5, PA-12	34.50
Taylorcraft—side by side	23.25

Others on request
Specify colors: Black, Brown, Green, Gray, Red and Blue. (Cream trim $5.00 extra.)

HEADLINERS

Complete with all necessary zippers, stiffeners and attaching means, etc. Ready to install! All popular colors.

Aeronca Champ	$16.80
Aeronca Chief	17.50
Beech 17 includes side walls	54.25
Cessna 140	21.30
Piper J-5, PA-12	14.95
Stinson 150-165	20.25
Taylorcraft, side by side	17.25

Others on request

CARPETS

Exquisite colors, deep pile. The finest woven rubber backed carpets, tailored to fit. Snaps included.

Aeronca Champ	$14.25
Aeronca Chief	7.50
Beech 17	28.00
Cessna 120-140	7.50
Ercoupe	9.00
Luscombe 8A, 8E	7.75
Piper J-3, PA-11, PA-18, J-5, PA-12	14.50
Piper Clipper, Pacer, Tri-Pacer	15.50
Stinson 10-A, 105	15.25
Stinson 108 Series	15.75
Taylorcraft, side by side	8.75

Others on request

AIRTEX SHOULDER HARNESS

For maximum flight safety!
Made of 3,000 lb. tensile strength webbing and forged steel fittings. Attach it yourself in minutes with no modifications. Used with your regular safety belt. Complete instructions supplied. ("Extension strap" required if your chair back is the hinged type.) Specify make and model of plane. Standard colors. WRITE FOR ILLUSTRATED CIRCULAR.

AIRTEX Shoulder harness $5.20 ea., Extension Strap $4.40 ea.

AIRTEX HAS EVERYTHING!

AIRTEX is your one stop for all aircraft textile products, including • Safety Belts • Curtain Sets • Baggage Compartments • Seat Slings • Tie-down straps • Boots • Wind Socks • Engine, Windshield and Canopy Covers • Recover Envelopes and Supplies • Randolph Dopes and Thinners

SEND TODAY FOR *FREE* CATALOG & SUPPLIES PRICE LIST!

Airtex Products
20-22 Union Street Morrisville, Penna.
CYpress 5-3462

Have You Read?

By JAMES F. SUNDERMAN

AIRPOWER: THE DECISIVE FORCE IN KOREA, edited by James T. Stewart, USAF (Van Nostrand, $6.50) is the first airpower book to appear on Korea. Basically a professional analysis of the tactical air phase of the campaign, its liberal inclusion of air combat photography helps to tell the story.

The book is an edited collection of 20 articles and air strike studies written by the men who fought the war. Leading off is a review and discussion of the role and mission of air forces by General O. P. Weyland, USAF, FEAF wartime Commander. During the early days, airpower blunted the enemy attack and allowed UN troops to maintain a foothold at Pusan. The Pusan breakout posed no great problems. Air strikes had disintegrated enemy logistics and shattered North Korean armies. UN troops raced to the Yalu. When the "Chicoms" entered the war, extending their exposed supply lines southward down the peninsula, air interdiction took such a toll of enemy supplies and men that the numerically superior Communist armies ground to a halt near Seoul.

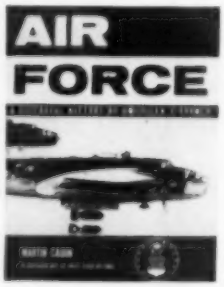
During the last two years of truce negotiations, a 24-hour round-the-clock UN air attack on troops, supply dumps, road and rail lines reduced enemy logistics received at the front to less than 10 per cent of that dispatched from Manchuria. Over nine enemy divisions were destroyed from the air. Unable to mount a major offensive, the Chinese dug in while UN forces were prevented by political restrictions from moving against them. Thus the war became a stalemate. Massive jet strikes of WWII proportions against the electric power system, the irrigation dams, the Sinanju bridges and other target complexes, have become classic studies of jet tactical pressure applied to achieve limited objectives.

Weyland emphasizes that the objectives, both air and ground, were favorable truce terms—*not victory*. Both surface and air forces were limited. Only airpower, however, could be applied offensively on a scale to punish the enemy and force him to terms.

The subsequent sections of the book detail how this was done, what results were attained and what lessons were learned for future wars with atomic weapons. It discusses the battle for control of the skies—the F-86—M-15 actions; the role of the medium bomber, light bomber and fighter bomber; and the support operations like photorecon, airfield construction, air rescue, and troop carrier; and a final overall review—looking back over Korea and forward to possible future limited wars.

THE WORLD'S FIGHTING PLANES, by William Green and Gerald Pollinger (Hanover House, $3.95) is a handy pocket-sized volume of 500 photos and three-view silhouettes of more than 240 bombers, fighters, transports, trainers and helicopters active in the combat air forces of the world, including Russia. Many types of aircraft shown are WWII models, still serving an active role. Photos are supplemented by brief histories of each type, data on operational performance, design and armament.

AIR FORCE: A PICTORIAL HISTORY OF AMERICAN AIRPOWER, by Martin Caidin in cooperation with the USAF (Rinehart, $10). Covering 50 years of military airpower, this work transcribes in 400 "action" photos and 60,000 words of narrative, the story of American military aviation from the first Wright Flyer to the Snark and X-2. Its publication coincides with the USAF's 50th Golden Anniversary Year.



Caidin wraps up this step-by-step photographic documentary in an attractive format that vividly captures the drama, bold vision, heroism, incredible progress and accomplishment that shaped the growth of airpower.

Throughout the 21 sections of the book is interwoven the theme of the man, the airplane and the concept. The aircraft, per se, is treated in development and operation, not as an individual piece of hardware but as a part of a weapons system. Especially interesting to former military airmen is the colorful treatment given the WWII years.

Two important periods might have been more stressed. One is the Korean War, a "turning point" in military airpower. For it was here, under combat, the Air Force converted from a WWII to a modern jet force. Replacement of conventional aircraft with the jet called for many readjustments in air tactics, techniques and support elements. All of this was accomplished, along with experimentation and training, in the war theater without interruption of combat operations. It provided valuable experience that might well (but for Korea) have been learned too

(Continued on page 95)

Chief pilots Frank M. Briggs and Richard Vinal (L/R) discuss with Fisher extensive flight testing with Champions. Veterans of 22 years with Pan American World Airways, the two captains are responsible for all Miami test flights for the "World's Most Experienced Airline."

Another in a series on the care taken by leading airlines to maintain top flight efficiency—and why this care has led them to select CHAMPION SPARK PLUGS. Noted aviation authority reports on Pan American World Airways . . .

"World's Most Experienced Airline"

by **HERB FISHER**

international aviation authority, veteran test pilot, and author

(Advertisement)

HERB FISHER

Just Over the Horizon . . .

Crowning the gigantic Pan American World Airways Maintenance and Overhaul base at Miami International Airport—like a royal crest of honor over this gateway to Central and South America—are these brilliantly lighted words: "World's Most Experienced Airline."

No airline slogan has commanded more unqualified global respect. Since the maiden flight of its Jenny-type Fokker F-7 tri-motor "Clipper" 30 years ago, Pan American has distinguished itself with a singular history of world-wide aviation development and airline safety.

Pan American pioneered transoceanic routes to South America, Europe and the Orient. Its famous Clippers have flown more than 700,000,000 miles—equivalent to 28,000 trips around the globe. PAA has carried well over 10,000,000 commercial passengers to and from six continents and 82 countries and colonies over the Earth.

Pan American told me it has received more awards than any other airline—tangible testimony to an excellence of performance based on experience in operation and maintenance. In international aviation circles, Pan American has become synonymous with efficiency and safety experience.

Receiving a cordial invitation, I spent several days inside PAA's Miami Overhaul Base (MOB), delving into why Pan American maintains a top position in the air transport industry. This overhaul base occupies 50 acres, 30 under roof, and employs some 2,500 year-round workers. It's the largest airline overhaul plant in the world . . . home base for Pan American's headquartered Latin American Division fleet, serving Central and South America, as well as overhaul center for PAA's Atlantic Division, covering Europe, Africa and the Middle East.

Establishment of MOB in 1948 marked another historic first for Pan American: first time a mass-production, factory-method operation in airline aircraft maintenance had ever been tried. Now, with more than 10,000 engines alone having been overhauled there these past eight years, MOB is an airline industry model.

Each of Pan American's 135 multi-engine aircraft comes in biennially for complete disassembly—Boeing Super Stratocruisers, Douglas DC-4's, DC-6B's, DC-7B's, DC-7C's, Convairs. The whole ship is dismantled and reconditioned from wing panels to cabin carpeting. Engine parts, for example, are chemically and mechanically cleaned until not a vestige of dust or baked-on carbon remains. Parts are then minutely examined with the most modern inspection equipment to insure their soundness and suitability for reuse. Throughout reassembly stages, each unit is tested for operational perfection.

Like ships of sea, giant Clippers of Pan American, too, must come in for a "dry docking" to insure maximum public safety. They're completely disassembled and reconditioned. A special 75-ton dock of movable and stationary sections was designed by PAA to handle this double-deck "Strato" Clipper, largest commercial airliner in operation.

Self-explanatory are these safety reminders, which Fisher observed throughout the Miami Overhaul Base. Maximum safety efforts from the ground up—up to the stars—put teeth in the slogan, "World's Most Experienced Airline."

Veteran pilots and crew members get constant refresher courses to keep them at peak efficiency. They're required to spend many hours in this "flight simulator," a classroom cockpit duplicating flight conditions.

(Advertisement)

. . . But, in the Beginning . . .

"World's Most Experienced Airline". . .

a special report for Champion Spark Plug Company

A look at the immediate future with a nostalgic glimpse into the pioneer past is provided by these two Clippers, the pride of their respective eras. Representative of *Tomorrow's* Clipper is this Douglas DC-8 jet. Pan American's jet Clipper fleet – Boeing 707's and DC-8's – is scheduled for service in 1959 and will transport up to 150 passengers per plane at speeds around 600 mph. *Yesteryear's* Clipper, this Sikorsky S-40, was the first PAA plane to bear the now-famous "Clipper" title . . . also the world's first four-engine commercial seaplane. It was delivered to Pan American 26 years ago.

Finally, the completely reconditioned engine is tested on one of Pan American's giant engine test stands for multiple assurance of functional perfection.

Engine Overhaul at MOB occupies a seven-acre building, where up to 300 engines per month can be completely reconditioned. Ignition system overhaul is done in the Accessory Overhaul building, a structure almost as large as Engine Overhaul.

As a pilot, you're not long in the driver's seat behind an engine before you realize the heart of a powerplant is its ignition system. Having spent more than 12,000 hours aloft behind hundreds of engines, I was most anxious to inspect Pan American's Ignition Overhaul. Here, Pan American reconditions everything from magnetos to spark plugs.

The spark plug, of course, is the vital powerplant life-giver upon which all other plane parts are dependent to stay aloft and safely power millions of passengers millions of miles through all kinds of atmospheric conditions.

As I observed installation of spark plugs in the many types of overhauled engines, the very capable manager of MOB, Santos Ceyanes, explained: "We've used Champion Spark Plugs for years. Occasionally we test other plugs, but we always return to Champions. We fly Champions an average of 350 hours between removals. We've never found a better spark plug, and we've tested them all, extensively. Reliability and performance dictate Champions as our necessary choice. Long life, service and economy bolster those vital requisites of choice."

In selecting a spark plug for an aircraft engine, the engine manufacturer first runs exhaustive tests to determine what plug best meets heat-rating and other operational requirements of the engine, William W. McClintock, powerplant engineering superintendent, told me. Then, a limited quantity of the appropriate plug is released to the airline for flight evaluation. A history of the plug's characteristics—performance, reliability, gap erosion, total life, ease of reconditioning, etc. —is recorded throughout testing. Spark plug histories are carefully compared with those from tests of other spark plugs.

"Champions have surpassed other plugs in these tests since we began using Champions in 1943," Mr. McClintock said. "We find, for example, that Champions give us less lead fouling and electrode erosion while maintaining excellent ceramic stability. MOB-overhauled engines have accumulated millions of high-efficiency hours while using Champions."

As powerplant engineering installation supervisor, Morton H. Woolf heads the engineering staff charged with evaluating ignition system test results. With cold objectivity, then, he selects Champions.

Handy with a tape recorder, Fisher talks to Santos Ceyanes, manager of the Pan American Miami Overhaul Base, about the magnitude of overhaul and maintenance that has contributed to PAA's well-earned safety slogan, "World's Most Experienced Airline."

Douglas A. Shropshire (L), Champion aviation representative, gives technical assistance to (L/R) G. F. Sheppard, an Electronics general foreman, and Clyde Walkup, assistant Ignition Overhaul foreman.

When engines have been reconditioned right down to the last nut, bolt and spark plug, they're reassembled and tested in this Engine Test Cell.

(*Advertisement*)

An extra safety precaution is taken by Flight Engineer W. F. Kellegrew, a 15-year Pan American veteran who takes nothing for granted: he double-checks his wing-tank fuel supply preparatory to taking off for Latin America. Airborne, he feels secure behind engines equipped with Champion Spark Plugs.

According to L. R. Sayre, a 27-year Pan American veteran and assistant service superintendent, the calculated decision to use Champions has been remade every year since the original decision 14 years ago.

Henry Mossberger, powerplant engineer directly responsible for ignition engineering problems, told me how the Champion Spark Plug Company has "given every cooperation and assistance" in extending the spark plug lifetime sufficiently beyond that of other plugs, providing the ideal combination of plug economy and reliable performance. "After hours of exhaustive extended-life service tests, we find the die-hard Champion without equal."

At this point, I had been thoroughly checked out in the operation of PAA's massive Miami Overhaul Base by an efficient staff. I'd seen the great Clippers of the "World's Most Experienced Airline" disassembled and reconditioned right down to the last spark plug.

And, in the end, I know—being an old test pilot myself—that it is the pilot himself who has the real throttle-hand appreciation of the engine. Capt. Richard Vinal, assistant chief pilot, technical, and a 22-year PAA veteran, confirmed my feeling: "I run flight tests, demonstration flights and performance checks. In these, we've used Champions for many years. They're unequaled. Herb, I use them in my car—and even in my lawn mower."

Capt. Frank M. Briggs, Latin American Division chief pilot, added: "In my 22 years with Pan American, I've logged more than 16,000 hours—mostly on Champions. Everyone knows the high safety record Pan American has, and, quite naturally, we've guaranteed this safety experience to the public with use of the best possible parts and equipment. Herb, I feel very strongly about the success we've had with Champions."

Over-all, the importance of a vendor's cooperation, and Champion's in particular, was summed up by R. D. Charles, MOB assistant superintendent of overhaul and a 27-year PAA veteran: "Champion's close cooperation and efforts to constantly improve the product—new insulators, for example, and lighter type construction, incorporating the best materials—point up the fact that we are using one of the finest products in the field."

Wherever I went and with whomever I talked there at MOB, the reasons for using Champions became increasingly obvious. Service, reliability, long life and economy seem to sum up Pan American's reasons for unanimous Champion preference.

—by Herbert O. Fisher

Discussing engineering tests are (L/R) William W. McClintock, Powerplant Engineering superintendent; M. H. Woolf, Powerplant Installation Engineering supervisor; Fisher; and H. I. Mossberger, Powerplant engineer.

"Champion's close cooperation and efforts to constantly improve their product point up the fact that we're receiving the finest spark plug in the field," R. D. Charles, assistant Overhaul superintendent and a 27-year PAA veteran, tells Fisher.

A. S. Galbraith, Division Supply Manager, LAD-PAA: "Cost, quality and service life determine product selection. All three factors apply to Champions."

CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO

(Advertisement)

what's Linda Lacking?

Nothing . . . absolutely nothing. Except when the conversation turns to a man's future in aeronautics!

When you choose aeronautics as your career, you assure yourself a high-pay position with unlimited opportunities. The aviation industry, particularly in the fields of Aeronautical and Electronics Engineering is acutely short of qualified, technically trained personnel.

Take advantage of this shortage by enrolling at Embry-Riddle. A two-year intensive course at this approved technical institute leads to an Associate of Science Degree in Aeronautical Engineering Design or Electronics Engineering Design.

In addition, Embry-Riddle offers a multitude of other courses tailored to your specific interest. Whatever your course, you will receive individualized education under personal supervision of a faculty of specialists.

Mail coupon now for pictorial brochure and a complete outline of curricula. You'll enjoy study and play in Miami's perfect year-round climate.

FOUNDED 1926

Embry Riddle

AERONAUTICAL INSTITUTE

If you are the kind of young man who has the right "stuff-for-success," who wants to have an active part in the thrilling pace of this air-era, who wants above all a career in aviation . . . then

MAIL THIS COUPON TODAY!

DEAN OF ADMISSIONS, Dept. 94
Embry-Riddle Aeronautical Institute
Miami 30, Florida

Without obligation, please send FREE and postpaid, the particulars about courses checked.

Print Name

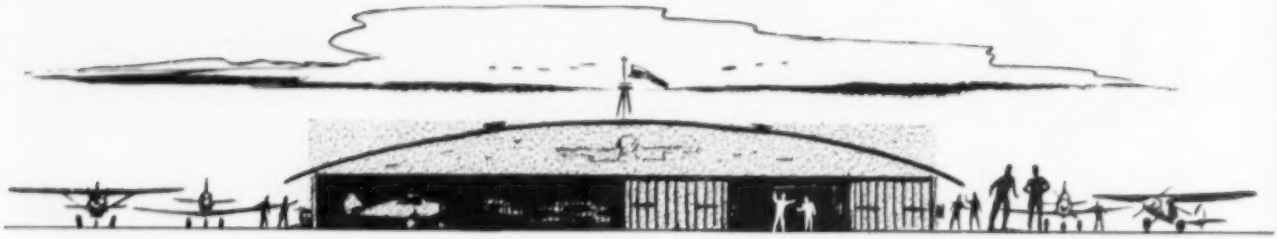
Address

City

State Age

I am a (check one) ☐ veteran ☐ non-veteran

- ☐ AERONAUTICAL ENGINEERING DESIGN
- ☐ ELECTRONICS ENGINEERING DESIGN
- ☐ BUSINESS PILOT
- ☐ AIRFRAME & POWERPLANT TECHNICIAN
- ☐ COMMERCIAL PILOT
- ☐ A&P COMBINED WITH COMMERCIAL PILOT
- ☐ INSTRUMENT RATING



HANGAR FLYING

SAVE OUR SOULS

ON SEPTEMBER 24, 1956, Mr. and Mrs. Jack Weston, a dog, a cat and all their worldly possessions, left Monroe, Mich. in the 36-foot houseboat, Aquapix, for a five year around-the-world cruise.

In the late afternoon of October 14th, after leaving Ericau, Canada, headed for Port Stanley, a leak developed in the boat. At seven o'clock that evening, the engine failed leaving them adrift and leaking badly. As they had no radio aboard, the Westons faced two possibilities, either sinking or running aground on the rocky Canadian coast of Lake Erie. Neither of the prospects were inviting.

As the only recourse left, they started to send the international SOS distress signal with their small, pitifully weak searchlight to all passing aircraft. At the same time, Capt. Peter Killian of American Airlines, took off from the Detroit Willow Run airport flying Trip 708, nonstop to Rochester, N. Y. Forty minutes later, cruising at 11,000 feet, the paths of Flight 708 and the floundering Aquapix intersected, and Captain Killian's attention became focused on the blinking lights in the darkness below. With monotonous regularity, the three dots, three dashes and three dots were repeated. Signaling with the airliner's landing lights that the message was received, Killian relayed the SOS to the American Airlines radio station in Detroit, giving its location. In a matter of seconds the air waves were humming with the emergency. Detroit radio called Air Traffic Control who in turn notified all planes in the area to be on the lookout for the crippled craft. The U. S. Coast Guard at Detroit was notified and it relayed the message to the main Coast Guard station at Cleveland. Ships on the lake were advised. Simultaneously, the Royal Canadian Mounted Police, who maintains coast guard service, was informed. The Royal Canadian Air Force was alerted, since they have an air-sea rescue unit in Trenton, Ont. With all coast guard units being out of position, the Provincial Police were phoned at Port Stanley. The police contacted skipper George Vary who had a fishing boat available. With the position given him, he and his crew set out to aid the crippled Aquapix. The tug arrived at the floundering houseboat at approximately 11:00 p.m. and towed it to port after making temporary repairs. The amazing part of the air-sea rescue drama was that only 20 minutes had elapsed from the time the SOS was spotted to when the rescue boat got under way. This included some 50 radio transmissions and telephone calls by two governments and eight government agencies.

Three days later the Westons shoved off but 15 miles out ran into a sand bank and had to be towed off again.

PETER W. KILLIAN

Hicksville, N. Y.

Mrs. Marjorie Bergman with the Flying Ballots.

BALLOTS BY AIR

FLYING BALLOTS are all in a day's work for Ray Franklin, owner and operator of Island Sky Ferries, and William Savage, proprietor of Marine Air, Inc., both of Friday Harbor, Wash. Last year, at election time, they distributed ballots by seaplane and landplane to the various precincts throughout the San Juan Islands in the Puget Sound. Supervising the handling of ballots was Mrs. Marjorie Bergman, San Juan county clerk. The ballots were packed and locked in special pouches, similar to those used by the post-office for transporting mail, then taken by car to the airport and seaplane dock. Mrs. Bergman saw the pouches loaded aboard the planes and watched them take off for their destination. Franklin flew to Orcas Islands where there are six precincts, while Savage delivered his ballots to Waldron and Shaw Islands, each having one precinct, and Lopez island which has two.

EDNA M. PLUMMER

Mount Vernon, Wash.

SOLO

I AM A PHYSICIAN, an eye specialist to be exact. There have been many thrills and great moments of accomplishment in my life as a general doctor and as an eye surgeon, but to this day there has never been a moment so filled with mixed emotions and of uncertainty, tension and exalted gratification as I was to experience while flying a plane alone.

Having spent four years as a combat air crewman in torpedo bombers back in World War II, I was not a total stranger to airplanes. I was induced into taking flying lessons by a slick-talking salesman. After eight hours of dual in an antiquated T-Craft, my instructor, thoroughly tired of risking his neck with each of my practice landings, opened the door, got out and told me to do it myself.

There I sat in the middle of the runway watching him walk off. Everything suddenly seemed complicated and confused. Without realizing what I did, I jammed the throttle to the firewall and "Old Betsy" began to bump over the dirt runway. Somehow the stick eased itself forward and I could see the farthest runway light head for me, then disappear below and there was blue sky just ahead.

The roar of the mighty 65 hp Continental whispered to me the advisability of throttling back and leveling off. This done, I could pay better attention to the rubbery feeling in my knees and arms. Just about then I gained courage to look over to my right and the full impact of the empty seat hit me. Thank goodness we had practiced landings until these maneuvers were almost automatic, for it was with this same sort of automatism that the plane flew a somewhat normal course around the traffic pattern. Practically before I was aware of it, there was the runway coming at me. The flare-out was a bit too late and the plane hit and bounced. The angel at my right shoulder helped to jam the throttle forward and an unseen hand eased forward the stick. A normal glide was reestablished, on the second bounce "Old Betsy" decided to stay put, coming to a gradual stop just a few feet from the edge of the

(Continued on page 73)

FIRST NONSTOP SERVICE between CLEVELAND -LOS ANGELES

You fly the Mercury in luxury

Only American offers nonstop service between Cleveland and Los Angeles—almost an hour faster than any other airline. You fly American's famous DC-7 Mercury, the luxury leader in the world of flight.

AMERICAN AIRLINES

America's Leading Airline

The Welding Power of Air Commerce

GILL ROBB WILSON
Editor and Publisher

FOLLOWING 170 years of experiment in self-government, the American people have accrued a unique responsibility—become the chief protagonists of self-government for all peoples—a heady mission.

Our effectiveness in this role stems from production capability, necessarily far-flung across the continent to take advantage of natural resources and to permit of elbow room for our expanding numbers—some 170 millions.

To fuse this continent-wide enterprise into an effective and manageable whole requires the utmost ingenuity in transportation. Such factors as specialization, research and development, subcontracting and strategic dispersal of vital elements has vastly magnified the significance of timing. In fact, finesse in timing is the key to all modern production and marketing.

Providentially, air commerce has put this key in our hands. The airlines' acute ability to compact time and telescope space is the fulcrum of our capacity to weld together our widely dispersed enterprise. Even survival tends to become the art of precision.

In this connection, we may note that any people who ever played a major role in human progress held the transportation leadership of their times. For example, the Roman Empire was founded on the wheel and smooth highways, the British Empire on seaworthy keels, the American conquest of the west on rails—each media the superlative agency of its era. Go where you will in the world, or wander where you will in the ages, the arbiters of history always have commanded the latest vehicle.

This being the case, the American people now must lean heavily on air transportation and expect to find that their national airlines are adequately capitalized, permitted profits to attract investment, equitably adjusted for best competitive results, and fully able to equip with the latest aircraft.

It may come as a shock to many that such is far from the case. Indeed, mild panic over their situation prevails both inside and outside the airline industry. Airline stocks have been leading stock market declines. Investment trusts have withdrawn money from airline support. Holders of airline stock over the past decade have averaged only about one-third of the returns enjoyed by investors in utilities, industrials and railroads.

Note likewise that in the years since Pearl Harbor, railroad fares have increased an average of 47.1 per cent and the index of consumer prices has risen by 84.7 per cent; but airline fares have stood practically still, advancing only 3.6 per cent in first class travel and actually receding in coach travel which domestically constitutes 36 per cent of the whole and, in overseas travel, constitutes a whopping 64 per cent. Increase in mileage flown and burthen carried has been of scant help since competition is so ill adjusted that load factors, where the pay-off comes, are at reduced levels.

In the face of this, the airlines must come up with a billion and a half dollars for re-equipment with jet transports. The alternative is to retreat from the skies. Added millions will be required for new maintenance tools, storage space, engine stands and kindred materials. And to cap the climax, Washington has its quota of those who, for reasons best known to themselves, are vociferous for reduction in airline fares! This in the face of the accumulated effects of inflation, of ever rising costs and over-extended competition, of investment withdrawal, and of already obsolete fare structure.

There is something terribly wrong with this entire condition. Doubtless it has developed from the cross currents and pressures always present in government. And of course there are none so blind as those who will not see. But in any case, the five good men and true who sit on the Civil Aeronautics Board are challenged in the foundations of concept as rarely ever before. It is not a matter of refereeing between airlines or of competition between air and surface transportation, but of keeping faith with the national call to destiny.

Probably the competitive situation must be left to the working of time, but the ruinous trend should be halted in both domestic and foreign trade. The main relief must come in a more realistic fare structure and above all, in a more knowledgeable and conceptual appreciation of air commerce in its vital role of welding our strength into an effective and manageable whole. This is a responsibility of the government, not to the airlines, but to the people.

As for the airlines themselves—their management is not the last word in genius, but it has evolved a great national asset from nothing. It has carried out the pioneering of a vast new frontier. It has demonstrated high conscience toward the public safety. It has thrown itself into the breech in war. It deserves well of the country.

But that is not the point. The point is that a weakened airline structure is a blow to the mission of the people, to their responsibility and aspiration and prosperity—and to their chance of peace. Down the present path lies disaster and ultimate nationalization. And if this comes to the airlines, then why not the railroads and bus lines and public utilities and telephones and automobiles? And why not clear the air of business and private flying as a nuisance to national air traffic? It's an old familiar pattern. Governments which abdicate fundamentals of their strength have been following it to oblivion for centuries. END

Jack Gregson, Mennen's good-will ambassador, is seen on the "Wednesday Night Fights," (ABC-TV network) and the Robert Montgomery Show. Jack, a pilot for 22 years, flew DC-4's during World War II, is now flying his second Tri-Pacer.

"YOU CAN'T BEAT THE Tri-Pacer"

says JACK GREGSON, *well-known TV star and veteran pilot*

"For my money, the Piper Tri-Pacer is tops. There's just nothing in its class that will match it for performance, flight characteristics and handling ease. Having flown four-engine transports on the Pacific run during World War II, I have a lot of respect for the Tri-Pacer's stability and 'big airplane' feel when the going gets rough. And there's no instrument pilot who doesn't appreciate the special attention Piper has paid to placing the instruments and radios right where you want them. The Tri-Pacer is really a good airplane that experienced pilots appreciate.

"Comfort-wise the Tri-Pacer is quiet, roomy and has ideal temperature control. Two heaters keep the cabin at living room temperature when it's below zero outside, and five cool air vents keep you cool in the summer. I'm six feet two, but the individually adjustable front seats assure perfect comfort.

"Dependability is the final thing I like about the Tri-Pacer. Everyone knows the Lycoming 150 horsepower engine is the finest private plane powerplant available and, after flying behind it for three years, I can't speak too highly of the peace of mind the Lycoming gives you. From every point of view, you just can't beat the Tri-Pacer!"

YOU'LL agree with Jack Gregson when you fly the exciting, new Piper Tri-Pacer. 150 horsepower, over 130 mph cruising speed at 7000', simplified controls, tricycle landing gear. Only $7,830, priced far less than any other four-place business plane. See your Piper dealer or, for full-color brochure, write Dept. G-7.

PIPER
AIRCRAFT CORPORATION
LOCK HAVEN, PA.

MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

We customize your business airplane to your requirements

Nowhere else in America can you find equivalent conversion facilities or experience

We can convert your airplane's interior to make it an airborne office, a combination office and lounge, a luxurious passenger carrier, a combination passenger and cargo carrier or to any other specification you desire.

We can improve its performance with larger engines, auxiliary wing tanks, instruments, the finest in radar and radio equipment and new complete systems in all categories.

Engineering, sheet metal, structural analysis, design, cabinet making, trim work, testing and other work are accomplished in our own facility. This covers more than 100,000 feet of floor space all contained under one roof.

Our customers are our best recommendation. They include the finest aircraft, industrial and commercial companies in the United States.

We invite you to inspect our facilities. Write or telephone for complete information about our services.

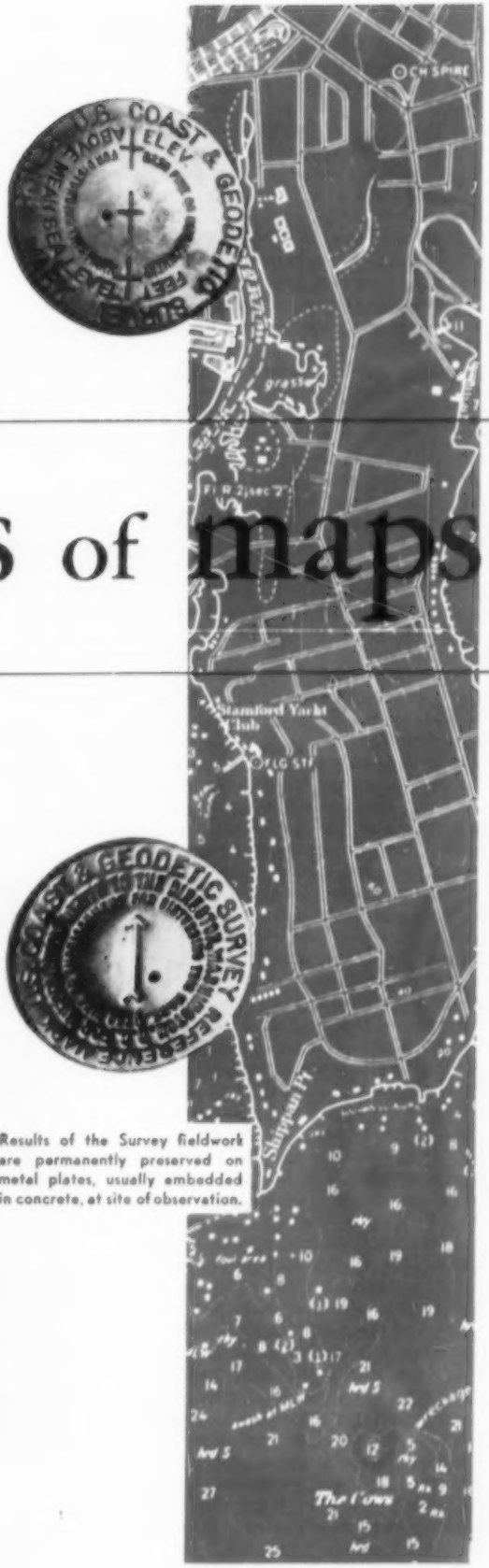
THE GARRETT CORPORATION

AiResearch Aviation Service Division

International Airport, Los Angeles, Calif. • Telephone: ORegon 8-6161

Conversion and Modification • Custom Interiors • Electrical and Instrument • Radio and Electronics • Engineering Service • Turn-Around Service

Organized in 1807, the Coast and Geodetic Survey has a heroic and useful past and a challenging future.



Results of the Survey fieldwork are permanently preserved on metal plates, usually embedded in concrete, at site of observation.

150 years of maps

By NEAL H. DUNCAN

COAST AND GEODETIC SURVEY. How remote the title sounds from any concern of the airman! Yet here is the source of much of the airman's fundamental information—description of the land-contours over which he flies, basic navigation data on the charts and maps he uses, magnetic declination or variation essential to the utility of his compass.

First of all technical bureaus organized within the government of the United States, the Coast and Geodetic Survey is celebrating 150 years of service. In 1807, President Thomas Jefferson, in his annual message to Congress, recommended its creation. The legislators immediately empowered Jefferson to establish the Bureau and place it under the Treasury Department. As we shall see, it met an imperative need at that time and has remained a key operation in the evolving progressions of our national development.

Jefferson always had an eye on broader horizons. He consummated the Louisiana Purchase, planned the Lewis and Clark Expedition to the Northwest, sought the acquisition of Florida to the Union, and foresaw a nation which reached from the Atlantic to the Pacific.

But he also saw a problem nearer at hand. Young America had only a few primitive dirt roads, no railroads or river bridges or canal systems. Sea transportation carried the bulk of her domestic and all of her foreign commerce. The British Admiralty had done precious little survey work in America during the colonial era. Even in Jefferson's time, the rivers and harbors remained uncharted, the shoals and islands had not been plotted and the coastline remained undefined except for strategic stretches here and there.

This situation had to be remedied if the new nation were to trade with foreign governments; and foreign trade was the life blood of the struggling states. Anchorages must

be defined, tidal data made available, channel courses marked out and navigational bearings published.

Although there were relatively few scientists and notable engineers in the new nation, its economy being primarily agricultural, Benjamin Franklin had gathered a number of brilliant ones together in The American Philosophical Society. Jefferson sought the advice of The Society for a plan of survey, and the nomination of someone adequate to head the undertaking. The name of Ferdinand R. Hassler, a Swiss immigrant and an eminent engineer-scientist, then professor of mathematics and natural philosophy at Union College, Schenectady, N. Y., came to the fore. Hassler had made a geodetic survey of Switzerland before coming to the western world in 1805. He now proposed a complete triangulation survey of the whole coast, including determination of the longitude, latitude and azimuths of the principal places. Hassler was appointed and launched on his work of organization and planning.

It soon became apparent that only in Europe could be purchased or designed the paraphernalia necessary to the survey. Hassler spent the next four years abroad, overseeing construction and design of the tools he needed.

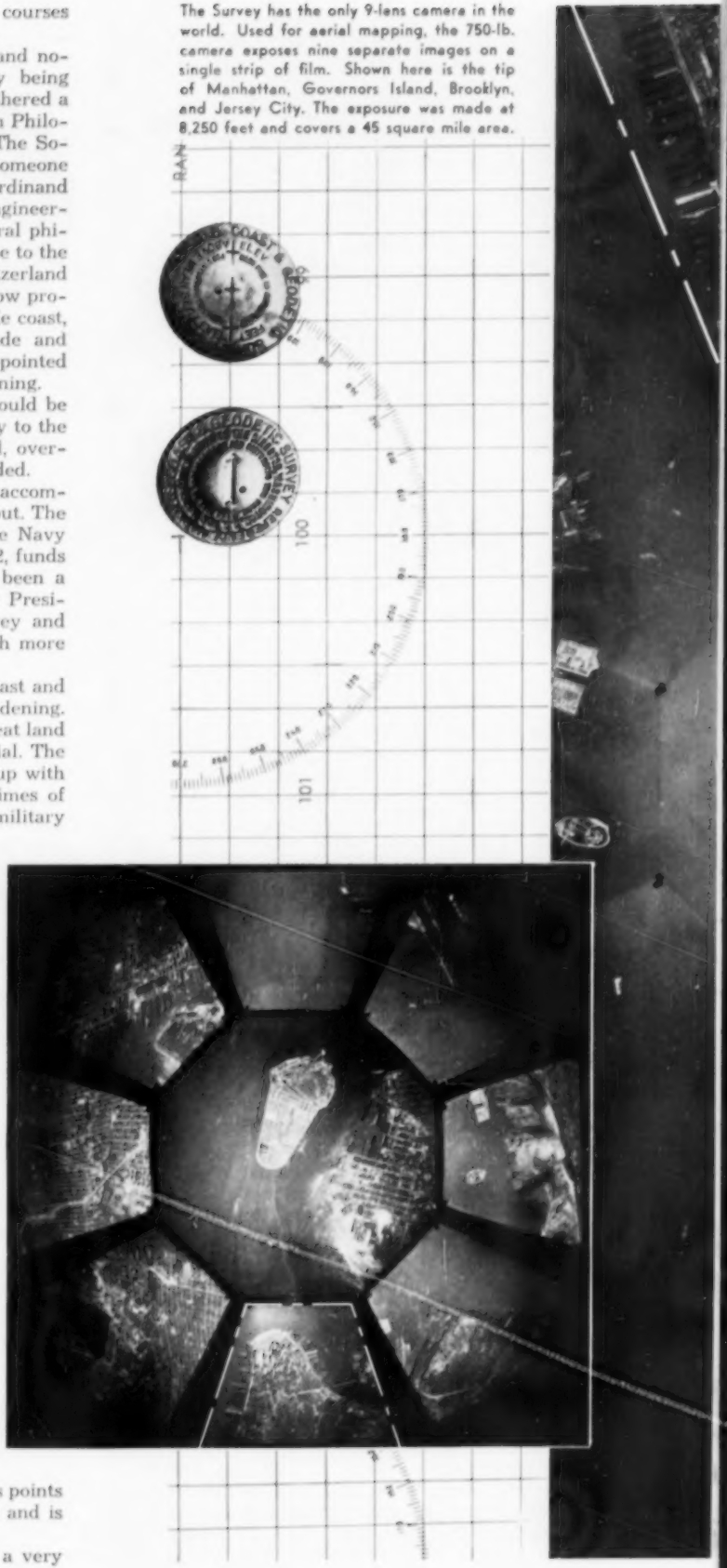
In 1816, field work was begun and much was accomplished in the next several years. Then funds ran out. The Survey was transferred to the Department of the Navy and activity came to a standstill. However, by 1832, funds again were available. James Madison, who had been a prime mover of the original project, had become President. He urged Congress to reactivate the Survey and legislation was passed to that end, and on a much more comprehensive basis.

From that time until now, the activity of the Coast and Geodetic Survey has been ceaseless and ever widening. As westward expansion took root, the survey of great land masses, as well as of coastal areas, became essential. The C&GS never has, and probably never will, catch up with the basic work that stretches out ahead of it. Times of war find it mustered into operational service with military requirements. And always there is some imperative current need arising, such as survey of the coastal shelf in the interest of developing oil and other natural resources, which must be immediately exploited. In instances such as the acquisition of Alaska, Hawaii, the Philippines, Puerto Rico, the C&GS is socked with heavy responsibility to guide the national policy. And of course, in these times, the advent of air commerce has demanded an incalculable volume of work.

Perhaps, before going further, it would serve some purpose to define the significance of the designation, Coast and Geodetic Survey. The term "coast" is familiar to all. It refers to the seacoast. The term "geodetic," may not be so familiar. Let us approach it with a term that is familiar—geography. This word derives from two ancient Greek words—gaia (the earth) and graphe (description). Geography is a description of the earth and its life. But we could not have much concept of geography unless we had a way to measure it. So we have another word—geodesy. This word comes also from two ancient Greek words—again, gaia (the earth) and daiein (to divide). Geodesy is the science of dividing, or measuring the earth. Geodetic survey is the science of survey from the standpoint of global dimensions. It is accomplished by triangulation of various points on the earth's surface with fixed heavenly bodies and is accurate down to a hair's breadth.

Without geodesy, modern civilization would be a very

The Survey has the only 9-lens camera in the world. Used for aerial mapping, the 750-lb. camera exposes nine separate images on a single strip of film. Shown here is the tip of Manhattan, Governors Island, Brooklyn, and Jersey City. The exposure was made at 8,250 feet and covers a 45 square mile area.



confused project indeed. Upon its findings depend the integrity of national and international boundaries, the property rights of individuals and businesses, the highways, seaways and airways of transportation, the location of earthquakes and other phenomena of the earth's structure, the definition of areas of natural resource, the constantly shifting magnetic influences, and hundreds of other basic considerations. Without geodetic survey, land maps would be but educated guesses and marine charts or aeronautic charts altogether impossible. While our founding fathers had a pressing temporary need for coast survey, they builded far better than they could possibly know in establishing the first technical bureau.

Admittedly, Coast and Geodetic Survey sounds forbidding and of remote interest to the average citizen—higher mathematics, astronomy, theodolites, seismographs, bench marks and coordinates—a haven for long hairs and mathematical geniuses. Actually this Bureau, presently manned by some 2,000 skilled people and presided over by some 185 commissioned officers, is an organization whose story is about as packed with romance and adventure as any group on earth, and their toil is fundamental to every man, woman and child in America. They have been everywhere and seen everything. If the tools of their trade are the sharp and balanced swords of science, none the less the people themselves are of a breed where not only scientific bent but a heart for adventure are requisite.

Field crews of their ranks have drifted away to oblivion on Arctic ice floes, and been swallowed by hurricanes at sea and caught by blizzards in the mountains. Whistler, the immortal artist, was an early draftsman of C&GS. Benjamin Franklin's grandson, Alexander Bache, led the Survey to notable defense of the Union in the Civil War. Peary, who made the historic trek to the North Pole, was one of their number. Teams of the Survey often went ashore under fire on South Pacific islands in World War II. Rather than being remote from the daily life of the nation and its immediate interests, the Coast and Geodetic Survey is intimately entwined with it.

While it is impossible in any single article to trace the long history of C&GS, or even to describe the vast ramifications of its services, some brief steps may be helpful in gaining a concept of it.

We already have seen that it was established in 1807, began field work in 1816, was curtailed from 1818 to 1832 and reactivated on a more comprehensive basis in the latter year. Its first maps were published in 1834—surveys of the New York, Long Island and Connecticut shores. In 1835, the first hydrographic survey was completed—the ocean floor off the south shore of Long Island. In 1839, the first nautical chart was published—Newark Bay.

Up until 1847 the vessels used were sailing ships. In that year the first steam driven cutter joined the fleet. In '48, just a year before the California gold rush, a survey of the Pacific Coast was gotten under way. In anticipation of the purchase of Alaska from Russia, a survey of the Alaskan coast was undertaken in 1867. Four years later, Congress broadened the responsibility of the Bureau and C&GS plunged inland. It was in 1878 that the present name, Coast and Geodetic Survey, was officially applied. By 1895, a triangulation line of points fixed in longitude and latitude was established across the continent. In 1903, following charting and surveying of the Philippines, the C&GS was transferred from the Treasury Department to the Department of Commerce and Labor and, in 1913 when those departments were split, it was left with Commerce.

For the duration of World War I, most of the ships and officers of the Bureau were assigned to the Navy and commissioned status for C&GS officers was inaugurated.

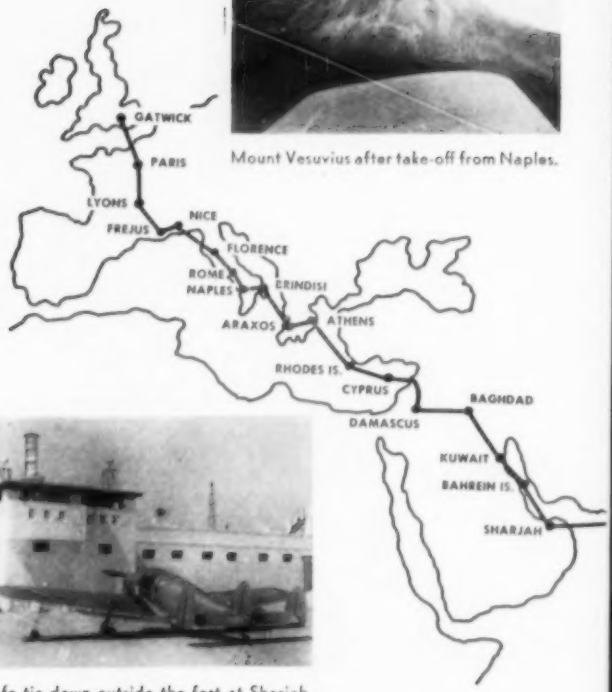
Radio acoustic ranging was developed in 1924 by the Survey for determining ship position. For World War II, six of the Survey's nine ships (*Continued on page* 64)

Racing against the monsoons along the 14,000-mile route, this couple succeeded in making a delivery flight of a Miles

Messenger to Australia

By NANCY ELLIS LEEBOLD

Mount Vesuvius after take-off from Naples.



Safe tie-down outside the fort at Sharjah.

I ADVISE YOU TO FLY half a mile off shore down this coast. You'll miss the turbulence and, if you do have to put down, then ditch in the shallows. The coastal stretch is fairly okay, but the interior is held by insurgents and we don't want to be messing about over ransoms for you."

Such ran our basic briefing from the Ministry for Civil Aviation in London. The officer walked us along whole walls of maps of the Middle and Far East. The Royal Aero Club has suggested that we avail ourselves of this prior to our 14,000-mile ferry flight of a Miles Messenger from Britain to Australia.

I had a keen desire to fly home to Australia and, when my husband joined me in London in February, we picked up various war surplus aircraft, but our ideal was not to be found. By the time you have secured 21 visas and convinced numerous legations that you are neither a political fugitive or spy, you wonder if the whole idea is worth the bother.

A south England flying club reported a Miles Messenger to be ferried to Australia, if details could be ironed out. The Messenger has a wooden airframe and a 142 hp D. H. Gipsy engine. Normal tankage was four hours and at 90 knot cruising, sacrifices would have to be made for more range. We limited our baggage to one change of clothes each, and removed 180 lbs. of soundproofing, rear seats and lining. A basic blind flying panel was already fitted and a very heavy, ex-RAF, VHF trans-receiver had to remain as its removal would have "constituted a modification in the airframe."

We fitted a 25-gallon tank in the cabin and connected it by a hand wobble pump to the filler cap of the port wing tank. In this way we did not tamper with the normal fuel system. The procedure was to take off on the 18-gallon port tank, empty it, then switch to the starboard tank while we pumped the port full again. To increase oil capacity we led a pipe up from the oil reservoir through the instrument panel where it blossomed into a funnel with a stopper. Every three hours, fresh oil was poured in from a can. Spare parts, survival gear, three briefcases of international documents and maps were sandwiched around the cabin tank.

There comes a time in every "expedition" when the only cure for delays is to get in and take off. After a farewell party we made a grand exit, only to land a few miles away at Gatwick for final official procedures. A snowstorm eased off as we cleared Gatwick Tower and headed across the Channel to cut the French coast near Boulogne. The shores were still pockmarked with craters from D-Day and some of the railways blasted out of existence then, have never been replaced. We landed at Toussus-le-Noble, the recommended light aircraft field adjacent to Paris. Not having their crystals we jockeyed with a host of French trainers for a visual approach onto the mesh strip. On advice from those who had gone before, we wore white flying suits with "Australia" tabs on the shoulders. This proved ideal as, irrespective of the local language, officials would quickly identify us and know our requirements. In addition it encouraged guards on more remote

fields to let us back to our ship through security fences and sentry posts where only some kind of uniform can gain entry.

Next morning we made Lyons for lunch and headed for Nice but darkness and a sea mist decided us to put into the French Navy Air Base of Frejus on the Riviera. A crashed Avro Lancaster squatted across the field, but we eased in with room to spare. The Messenger has an abundance of flap and a Youngman lifting wing-flap on the trailing edge. This lift was very handy on occasions when altitude and weight factors were not on our side. The French Navy, once satisfied with our papers, was outstanding in hospitality.

The new I.C.A.O. alphabet was in force and we wrestled with our extensive call sign "Golf Alpha Lima Bravo Papa." We popped into Nice to clear customs and set off for Florence which boasts a fine field restricted to jet use or "aircraft experiencing undercarriage difficulties," according to our guide book. Florence officials put good-humored obstacles in our way to make us stay the night, claiming that too few people came nowadays to see their beautiful city. We fueled and headed for Rome, arriving right at sunset at Urbe, the better choice for light aircraft on a budget. Tower officials jeeped us into town still dressed in overalls and clutching our 20 pounds of luggage in a parachute bag.

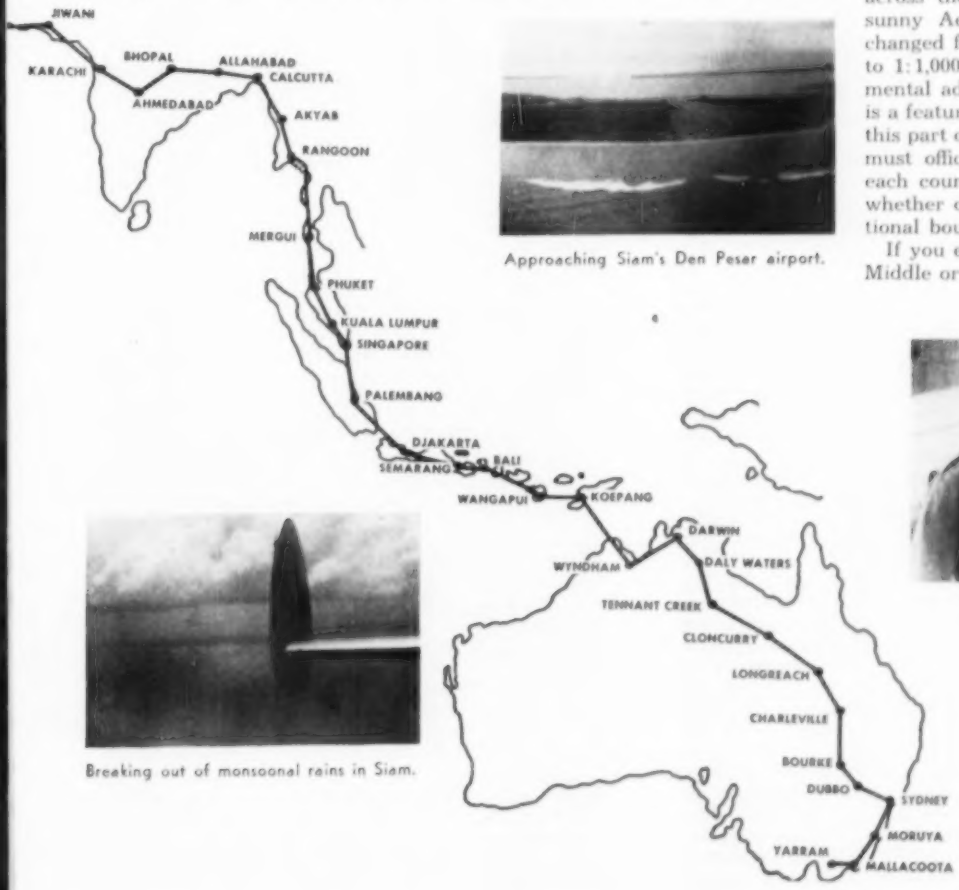
The Messenger had by now shaken itself down to a few minor oil leaks. I donned a pair of Arthur's Air Force overalls and made repairs. A crowd formed to watch a woman tinker with an engine and applauded the successful start up. There was a sequel. Oil-stained and with a beret pulled over my hair, my admission to the Ladies Room was barred by an irate woman who told me the facility was reserved for the weaker sex.

The flight to Naples was a delight-intense cultivation making a mosaic of greens and browns right down to the coastal strip. Bucking a head wind we were overtaken by an electric express as we entered Naples control zone! From Naples we cut across the backbone of Italy to Brindisi on the heel, zig-zagging through valleys to Bari, on the coast, then along the beaches south to Brindisi fast socking in with another Mediterranean sea mist. By now we were ready for a longer water hop and anxious to try our Dead Reckoning ability. For this we had a P8 magnetic compass and a drift sight. This we had improvised by removing an old signal flare gear and covering the hole with perspex, which was calibrated with two-degree drift lines by use of a hot darning needle. We crossed the Adriatic and made landfalls on various Ionian Islands, now learning to read the wind patterns on the sea, once we learned to disregard the routine swell patterns which were sometimes completely contrary. All this gave us confidence for the eventual crossing of the Timor Sea at the tail end of our journey. On the west coast of Greece is Araxos, a tiny Greek Air Force post which refueled us from rusty looking drums, but on test, the gas proved to be water free and quite fresh. The friendliness here was in contrast to officials at Athens who demanded our passports at every turn, searched our luggage in relays and swarmed over the aircraft with wire and lead seals before we even had it refueled. At Araxos we tied down alongside some visiting USAF Fairchild Packets.

Turkey was not on the recommended cruise course for light aircraft so we headed for the Greek Island of Rhodes, across the Dodecanese Islands in the sunny Aegean Sea. On this leg we changed from a map scale of 1:500,000 to 1:1,000,000 and made the necessary mental adjustments in our plotting. It is a feature of light aircraft travel from this part of the world onwards that you must officially enter and depart from each country each time you sit down, whether or not you cross any international boundary.

If you ever intend to fly through the Middle or Far East, be prepared to be-

Approaching Siam's Den Peser airport.



Breaking out of monsoonal rains in Siam.

The Leebolds on arrival at Sydney.

come a minor diplomat. The holding of one country's visa can put you in the doghouse with another country. Thus it was a carefully planned track that took us via Cyprus to Damascus and on our turbulent way across the desert. We were following the pipe line to Baghdad when a C-47 overtook us and asked on the R.T. —"Say, did you folks make that plane yourselves?" The broad mud flats of the Tigris guided our final lap to Baghdad. Here is a city worth a call from any aerial tourist. It has a very active Flying Club with friendly members. Most of their engineers or instructors have studied either in California or Britain. Our Miles sank into the hot bitumen at the designated tie-down spot but we rescued her. Afterward we went on a tour of the fabulous city and saw the famous Baghdad dancing girls in their own back yard. The floor show got better and better as the hour got later and later, but we had to get some sleep before a 4 a.m. take-off over the hot desert sands.

The Oil Country

When we had applied in London for visas for the Trucial Sheikdoms of the Persian Gulf, an official had confided to us—"You know there is no official time in the Trucial Sheikdoms." We assured him we would carry our own alarm clock. Dust storms were routine there but we missed the worst ones. We got a bearing from Basra by VHF and, 3:30 hours out from Baghdad, touched down at Kuwait—a broad sandy expanse in the oil country. A religious fast was in progress which forbade handling of food or drink from dawn till dusk. We went hungry. After Bahrein we landed one evening at Sharjah. Here we tied down outside the fort but slept inside this very "Beau Geste" structure whilst Arab guards patrolled the gate with ancient rifles and an assortment of ammunition worn more as a decoration than defensive supply. We lost a day with an attack of Sharjah "Tummy."

However, a detachment of RAF were camped inside a barbed wire compound and their doctor (who claimed he had been "exiled") gave us an antidote.

Unlike Iraq, Iran was not kindly disposed to non-sked light aircraft so our next leg took us across the Gulf of Oman to Jiwani—just inside the Pakistan Border. Before leaving Sharjah we learned that Jiwani had no high octane fuel so took on several cans of 100 to mix on a five-to-one ratio with Jiwani's 73, this gave us the necessary 80 octane with which to reach Karachi. For 4:15 hours we fought sea mist and offshore sand storms to reach Jiwani which nestled in a barren stretch between two rocky plateau. The staff at Jiwani were refreshingly pleasant and asked us to carry their mail to Karachi. Nothing else was scheduled in for another six weeks. Four hours brought us to Karachi who homed us in through another sea mist by VHF/DF. Our arrival was celebrated by enthusiastic officials who exploded an airliner-size insecticide "bomb" in our tiny cabin and shut the hatches down on us for two minutes. We had a permanent wheeze for weeks.

It was now a race against the Monsoons. Back in London the Aero Club had advised us that there are two ideal times at which to cross the Equator and avoid the worst of the tropical Monsoons. If fortune smiled here we might reach Australia before the first rains. The main hazard in Pakistan and India was the high ground and air temperatures which could vaporize fuel in the lines of any aircraft without boosters. Not so blessed, we wielded a thermometer frequently.

Crossing into India, we arrived at Ahmedabad where they really poured on forms and questions. Lacking other accommodations, the airport manager allowed us to bed down in his office that night and we were off at dawn into a blood red sunrise for Bhopal. Our information had listed "few facilities" here but in fact the field offered excellent hangarage and servicing from a live wire company which also flew and maintained His Highness' fleet of a C-47, a Twin Beech and sundry Navions. Captain McLennan, manager and chief pilot invited us to stay in the palace of the pre-partition Maharaja whose state was now part of the Indian Federation. We could have gone tiger shooting if we had stayed but our race against the Monsoons dictated a fast move on to Allahabad. This airport is now bypassed on International routes and its extensive lounges and administrative buildings are testimony to its past glory on KLM and Imperial Airways schedules. After completing paper work, we were allowed to sleep overnight in the airport lounge. This saved extensive time losses in checking out and organizing transport to the field and unfamiliar surroundings.

The Monsoons Strike

The race against the Monsoons was lost just as we approached Dum Dum Airport, Calcutta. No pre-forecast had revealed its presence to us at the last stop but here it was. Our little Messenger was picked up in a Monsoonal front and hurled around the Dum Dum circuit in blinding rain which drove with such force that it penetrated the cabin. Soon all was awash. The gale swept crosswind on the duty runway so hard that we pleaded with Dum Dum to let us use a secondary strip which was into the wind. Even as we circuited in crazy up and down drafts, a C-47 failed to make the cross-wind component and crabbed off sideways on a climb-out. Visibility grew less and less and our radio finally waterlogged out in the midst of another exchange with Dum Dum to let us in on the auxiliary runway. We went on instruments at 1,000 feet and decided to get out of the traffic fast until it made some sense. On the less frequented side of the pattern we sailed out before the wind and set an estimated course up the Ganges where we knew there were other fields. Patches of terrain showed through and we spotted Barrackpore—an Indian Air Force strip. It was free of traffic so we let down, made one circuit to announce our arrival (the rain was too heavy for the Tower to see us) and landed into the teeth of the gale across the run-up area at the end of the main runway. The Tower had glimpsed us appear and disappear in the storm and informed Dum Dum that we had crashed on their field. They were happily surprised when we taxied up in one piece with Arthur draped on a wing tip. The Commanding Officer welcomed us, but urged us to leave immediately as there was no overnight accommodation. They put out a flare path. We stalled until the gale let up slightly, but finally crabbed off and made it back to Dum Dum, which had no objection to us using the secondary runway, but mistook us for a Constellation in the poor visibility "because we had three vertical fins."

The Bay of Bengal had our profound respect. It had clipped far better flyers than ourselves, so we edged down the Burmese coast putting in at Akyab and thereafter Rangoon, which lists itself as a 24-hour airport. It has, however, an impressive array of overtime charges for sundry officials, should any services be prior to 7 a.m. or after 5 p.m.

We thought we had won through the Monsoonal thunderheads with their tops up to 40,000 feet when we reached the strip in the jungle at Mergui but alternate fields and dependable forecasts just do not exist south of Mergui towards Siam. We poked out each day for five days, sometimes getting 100 miles, then having to turn back in the face of a front down to water level. An Australian mining manager gave us shelter. We ran out of space on our Burmese visa for all the rubber stampings of arrivals and departures.

Our visas were due to expire on the day we resolved that we would break through to Siam rather than go clear back to Rangoon for "official processing." We wove in and out of deluges and sailed underneath interminable thunderheads, finally to arrive abeam Victoria Point. Resisting the temptation to visit Bangkok, we chose, instead, Phuket—an island on the west coast. When we had been in Rangoon a stranger had informed Arthur that we should fly over the town on arrival at Phuket. Local regulations prohibit any such flying and we were full of suspicion. Anyway, Phuket township was some miles south and our weather evading course from Mergui had emptied our tanks to below safe reserve for such antics. On landing we had trouble finding anyone, but later in the village met a British Vice Consul who invited us in for the night. "You know," he said, "I sent you a message in Rangoon to beat up the town so I would know to pick you up at the strip and save all the bother you've had." London had communicated our schedule to this remote spot and been active behind the scenes to a remarkable degree.

On to Indonesia

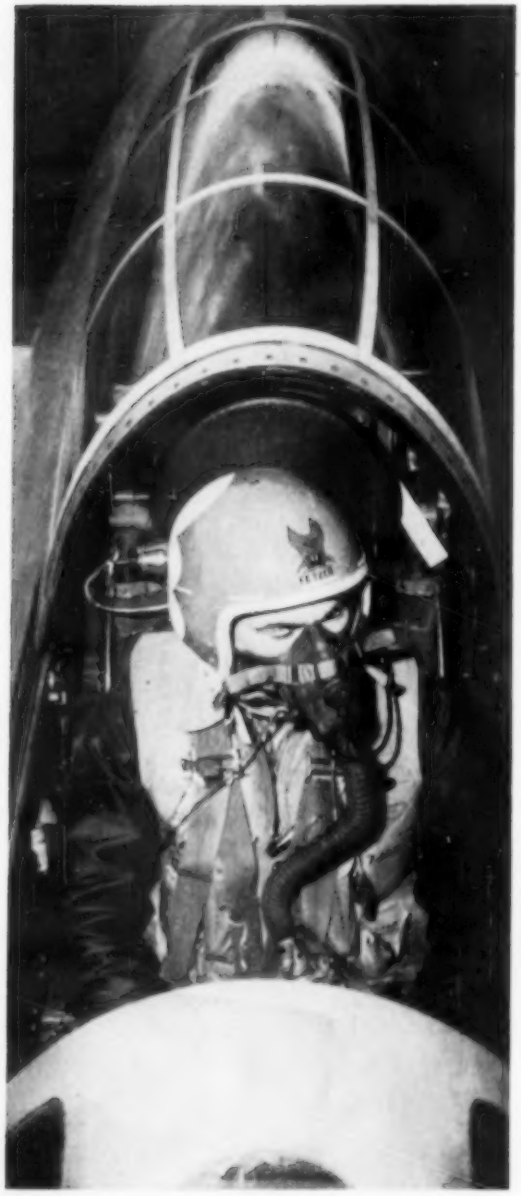
Next day we reached Kuala Lumpur in Malaya, an airport dotted with RAF Lincoln bombers, D. H. Beavers and sundry other types in action against the bandits not far inland. The lanky, short-field, Prestwick Pioneer was also in evidence. Kuala Lumpur has an active Flying Club, excellent facilities and good accommodation which helped us to spruce up a bit for arrival in Singapore next day. We were warned to have all our papers in order before entering Indonesia. We wondered if Indonesian officials could outperform some of the teams we had already

(Continued on page 74)

Bottled filet mignon dinner is jet pilot's diet at 50,000 feet.

Eating—A Problem at Altitude

By BEN PEARSE



Cockpit of Republic F-84F equipped with "pilot feeder." One bottle is seen behind pilot's helmet, the other, below his right elbow. Feeder tube extends from behind arm, to oxygen mask.

FOR FIVE YEARS, the Air Force has been fighting in the stratosphere against a generally unheralded foe—bellyache. No communiqués have been issued, but now it can be reported that the battle is won. No longer need combat crews far aloft fear the ignominy of indigestion.

Indigestion might not sound like a battle hazard. But in Korea, pilots on Mig Alley missions were often hampered by it. And, says Maj. Gen. George W. Mundy, of the Air Force, "No man can be at his best with a bellyache."

During World War II, the ceiling for most aircraft was 30,000 feet. For jets, used extensively for the first time in Korea, that altitude is practically a floor. Flying in the stratosphere it was learned, does strange things to the human body.

It is a simple fact, familiar to any high school physics student, that gas expands in rarefied atmosphere. A small bubble, caused by the chemistry of digestions, or even air swallowed while eating, expands seventeenfold at 50,000 feet. This expansion induced severe cramps which seriously hampered combat efficiency. The new hazard was finally overcome by a strict ban on flatulent foods and carbonated beverages, chief offenders in upsetting delicate gastric balance.

The advent of long range aircraft has greatly complicated the food problem. Missions in Korea seldom lasted more than three or four hours. Properly balanced meals before and after flights could keep flyers in top physical shape. Strategic aircraft however, stay up for many hours even full days. Under the strain of near-sonic speed at extreme altitude, a man will sweat off 15 pounds in eight hours of just sitting still. He burns up energy too. His mental alertness and physical reactions decline steadily in proportion to the time he is aloft, reaching the nadir at a most critical point, the landing. The only way to compensate for this loss of body liquids and energy is to furnish crews with food and water during flight. But eating at 50,000 feet isn't easy. Frozen, pre-cooked dinners are served on most Air Force transport planes, but equipment for storing and heating them is too heavy for combat aircraft. Furthermore, high altitude flyers wear clothing so complicated that a suit of medieval armor looks simple by comparison. Ivanhoe could lift the visor of his helmet, pop a tart in his mouth and flip the lid down again without breaking the gait of his favorite Percheron. But the high flying airman is beset among many indispensable gadgets with a tight-fitting oxygen mask moulded to the contour of his face. Unless it fits snugly, he may not be able to breathe.

Realizing the formidable nature of the feeding problem, the Air Force experimented on the Second Air Force flyers at Barksdale. Initial results were discouraging. The first ration tried consisted of bite-size morsels of steak for the main course, supplemented by a non-carbonated beverage, fruit and a cupcake. The protein and vitamin contents were high, and palatability was excellent. The trouble was that, at the altitudes strategic planes had to fly, it proved next to impossible for a (*Continued on page* 84)

THE AIRMAN'S WORLD

The airman's campus is ten miles tall
and the ivy twining its vaulted wall
has root in the breath of the misty strand
and the filtering fingers of land.

Its bounds are a scimitered edge of blue
which the eye may forge from a distant view
and its walks are traced by the contrail's frost
till the footsteps pass and the track is lost.

Its windows look to the compassed space
where the orbiting worlds are held in place
and made to glow by the beams that run
a million miles from the burning sun.

Its field of play is the purple plain
where the ear may catch the sphere's refrain
to the verses sung by the dancing stars—
and the thundering bass of Mars.

The savant day and the long haired night
hold class for the campus neophyte
with a text fresh writ each dusk and dawn
from the primal code they draw upon.

So come ye here who have heart to tread
in a tall man's pride with the thunderhead
and walk the scimitered edge of space
till the yearn of your heart finds peace.

GILL ROBB WILSON

The 1957 H35 Bonanza boasts a high speed cruise of 196 mph and a top speed of 206 mph. Service ceiling is 19,800 feet.

FLYING CHECK PILOT

REPORT ON THE

Beechcraft H35 Bonanza

By NORMAN JACOBSHAGEN

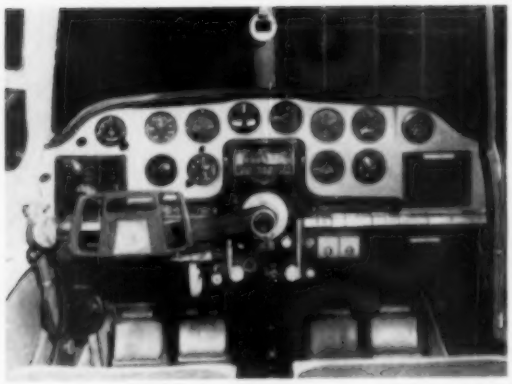
Bill Sampson, left, Bonanza's Chief Production Pilot, gives author all the "scoop" on '57 model's flight characteristics.

ALTHOUGH IT'S BEEN SEVERAL years since I've had more than a casual ride in a Bonanza, I felt right at home as I crawled into the cockpit of the 1957 H35 at the Beechcraft plant in Wichita. Over the past ten years since the first Bonanza was introduced, there actually have been few major design changes in the aircraft. The working part of the cockpit has changed very little. While to the novice it might appear to have a lot of instruments and switches, they're all logically placed, plainly labeled and natural to the hand and eye. If you're new to the Bonanza, it won't take long to get acquainted. This year, the principal news is an increase in horsepower from 225 to 240, giving the H35 a 196 mph cruising speed, and there's a greater gross and a lot more "plush."

With a minimum of help from Bill Sampson, Chief Production Pilot for Bonanzas, I ran through the cockpit check, fired up the 240 hp Continental, and got clearance from the tower for take-off.

The wind was south-southwest between 10/15 mph. We were within 400 pounds of gross, which is 2,900 pounds. This, incidentally, is up 115 pounds over last year's model, most of it due to heavier engine and beefier structure. The gain in useful load is 14 pounds, of which ten are for passengers or baggage. Without making any special effort at a short take-off, we broke ground just past the 500-foot mark. According to the handbook, the H35 will come off in 670 feet, with 20 degrees of flap and a ten mph wind. With no flap, it would take 1,080 feet to clear a 50-foot obstacle. The way we got off and climbed left no doubt in my mind that the figures are accurate and can be equalled by the average pilot.

First on the flight agenda was a timed cruise speed check in four directions. We used 156 hp which was 65



After 10 years of production, the Bonanza instrument panel shows no major changes and is very similar to the original.

The new Continental 0-470-0 engine, rated at 240 hp, is heavier than past models and is readily accessible for servicing.

A world of safety and many hours of pleasant, luxurious, high speed cross-country travel are offered in the new Bonanza.

The interior and the H35 features individually adjustable and reclining front seats, retracting arm rests and head cushions.

per cent of total. This is the highest setting given in Beech's chart for normal cruising. We came out with an average of exactly 180 mph. However, if you're in a hurry and don't care about gas consumption, power settings are given for 75 per cent of power at sea level, 2,000 feet and 4,000 feet.

Using the 75 per cent power setting at 4,000 feet, we got an indicated airspeed of 186 mph. This figured out approximately 200 mph, or four mph faster than Beech's figure of 196. This could have been due to being 400 pounds under gross. As a matter of comparison, this year's cruising speed runs about six mph faster than last year's, while top speed is 12 mph faster.

Using 65 per cent of power at the same altitude, we got an IAS of 176 mph which trued out to about 190. At 50 per cent of power, we indicated 144, which trued out to about 155.

Studying the cruise charts in the handbook can be very rewarding to the Beech owner or pilot. This airplane has the widest range of cruise powers, fuel consumption and speed of any single-engine business plane on the market. You can cruise as fast as 153 mph using a remarkably low 96 bhp—only 40 per cent of power—which will stretch your gas consumption to 7.2 gallons per hour. That's better than 21 miles per gallon.

But if you're the impatient type, you can cruise as fast as 156 mph. Of course that'll send your gas consumption above 14 gallons per hour. But here's the amazing thing—you'll still be doing better than most late model cars with almost 14 miles per gallon. And if you prefer long range cruising and have the optional auxiliary wing tanks, you can go 1,170 miles on 57 gallons.

How about climbing to cruising altitude? Beech says 1,250 feet per minute climb at (*Continued on page* 60)

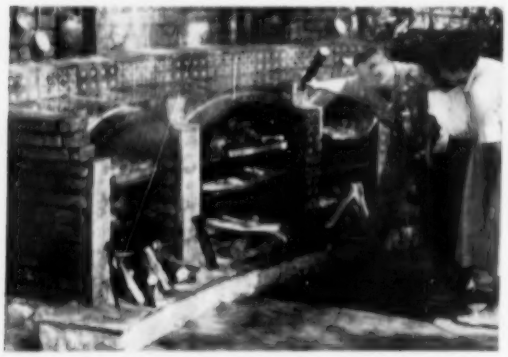
An all-metal hydraulically controlled propeller used for several years on T-34 trainer is now standard on the Bonanza.

Looking out on Cathedral Square in Havana.

The U. S. Coast Guard briefs cruise participants at Tamiami Airport.

Halfway to Key West lies 8,000-foot airstrip at Marathon, Fla.

Magnificent palm thatch cottages housed visitors at Mayajigua.



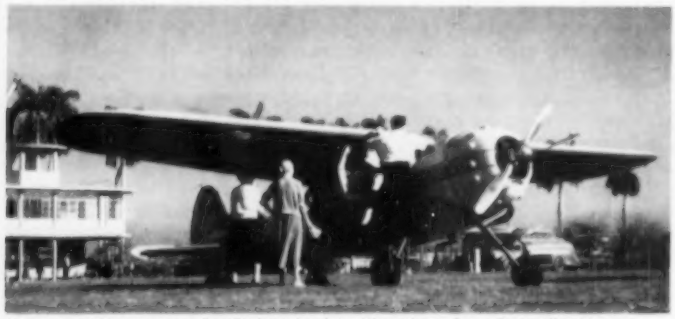
A big barbecue of chicken and pig was prepared for the fliers.

CUBAN AIR

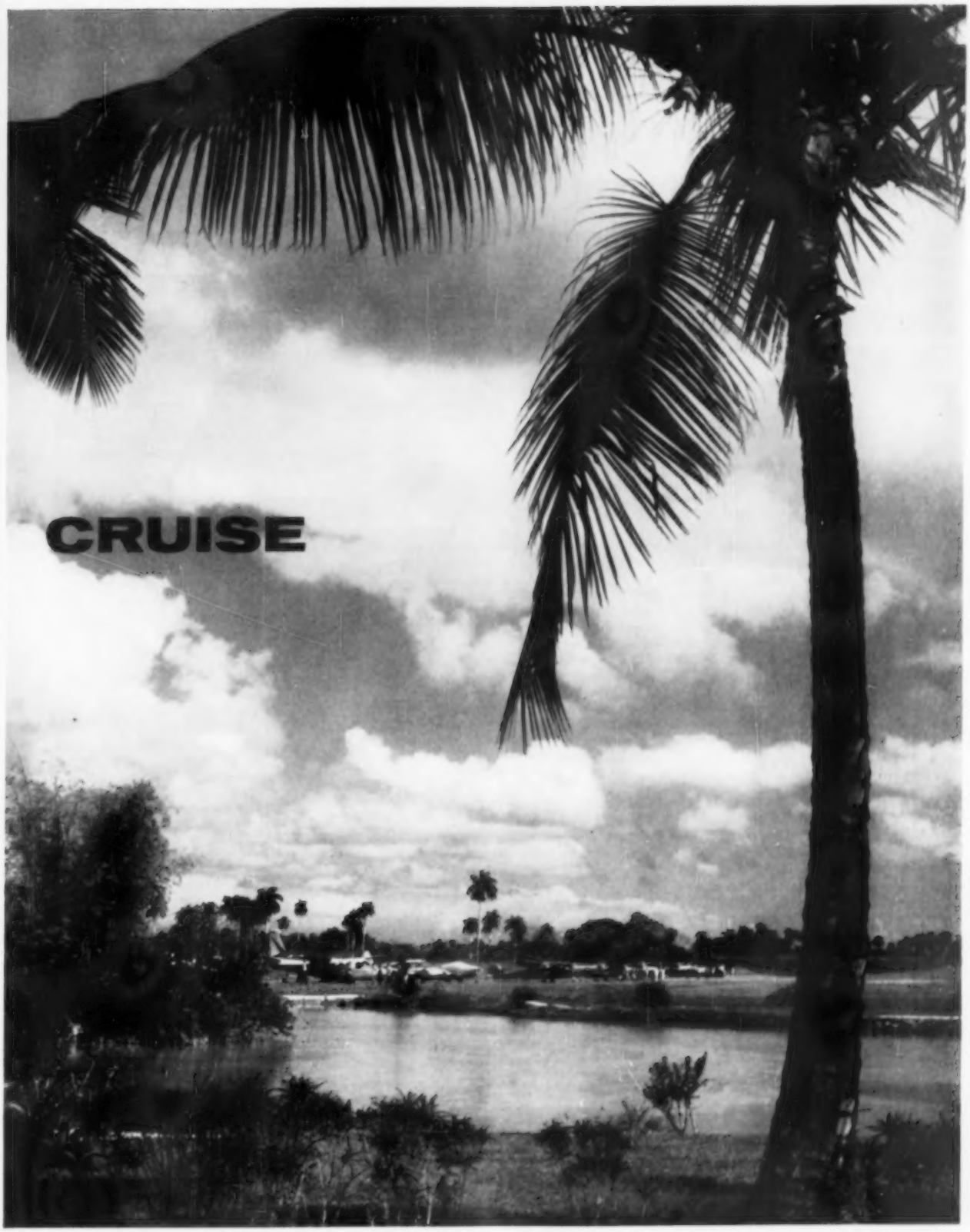
By HANS GROENHOFF

FLY SOUTH from the tip of the Florida Keys and in less than an hour you are over ancient and exotic Cuba. Although the airline distance from Key West to Havana is a mere 90 miles, the expanse of ocean between our two countries and the red tape of foreign air travel too, often have been a deterrent to the pilot with his sights set on a flying excursion to foreign shores.

To overcome this barrier a group of Florida Air Pilots Association members organized the Miami-Havana Air Cruise 15 years ago and have been conducting the annual tour for their fellow fliers from the North ever since. The Cuban Tour is presented in a carefully planned and complete package which relieves the pilot of all irksome travel details, leaving him free to fly and enjoy every minute of it. Included in the package are flight planning, safety measures, lodging, meals, entertainment and good



A Cessna 195 prepares for flight inland to Mayajigua from Santa Fe Airport.



Planes of the Florida Air Pilots Association members parked on the airstrip at tropical Mayajigua.

With all aircraft accounted for, everyone relaxes at Santa Fe Airport, Havana.

companionship. By virtue of this advance planning, and the generous assistance given by U. S. and Cuban government agencies, the Cuban Air Cruise offers a unique opportunity to the private flier to make the plunge across the ocean to a friendly foreign shore.

Take the case of Vernon Burt, a Florida contractor who holds a commercial pilot's license and owns a well-instrumented Cessna 172 which he has flown on business throughout the southeastern states and for weekend and vacation trips to his resort cottage in the mountains of North Carolina.

Vern's wife, Rose, never has shared his enthusiasm for flying, yet has always appreciated the convenience of using the 172 on their vacation trips. Although Rose was born in Key West, neither she nor her husband had ever been to nearby Cuba, and often longed to make the trip to this outpost of old Spain.

Vern is a cautious, methodical pilot. On his trips north he has always been careful to avoid shortcuts across water along the Florida coasts and wouldn't think of flying his single engine land plane over a stretch of ocean. But a conducted flying tour to Cuba, in company of other aircraft and shepherded by the U. S. Coast Guard, the CAA, the U. S. Weather Bureau and the Cuban Navy seemed both tempting and sound to cautious Vern and timorous Rose.

For a total fee of $68.25 each, they subscribed to the package which promised them two expense-paid days in Havana, and another day in Mayajigua, a mineral spa in eastern Cuba.

At the time of this year's Cuban Cruise, scheduled for January 8, 9 and 10, a stubborn cold front was locking the north-south skyways and marooned many fliers who had set their course and their hopes on the tropical tour. January 8, the day of departure from Tamiami Airport in Miami, started with low ceilings and darkening skies. But the sky soon opened up in typical Florida fashion, and 40 airplanes with their crews of more than 100 people showed up for the flight.

Like all other participants, Vern Burt received a flight kit containing not only coupons for lodging, meals, entertainment and transportation, but also marked maps, navigational advice, radio and weather data, emergency instructions and all the forms required by U. S. and Cuban authorities, ready to be signed.

At a pilots' meeting, a last-minute weather analysis, especially prepared for the cruise, was explained by W. L. Thompson of the Miami Weather Bureau. James G. Pace, the cruise director who had voluntarily shouldered the big burden of organizing and conducting the tour, answered last minute questions, and Lt. W. D. Harvey of the U. S. Coast Guard gave a thorough briefing on do's and don't's in case of an over-water emergency.

The Coast Guard was standing by with a helicopter at Miami and Key West, a picket boat 20 miles off the coast of Key West, a Coast Guard cutter halfway across the Florida Straits and a Grumman Albatross amphibian patrolling the entire over-water route. Moreover, the Cuban Navy had stationed a patrol vessel at a point about 20 miles north of the Cuban coast. A bad day for the sharks, indeed!

Vern Burt tacked his flight identification numbers in his cabin windows, made sur that his passengers had buckled on their Mae Wests, and proceeded to the runway where his flight number and take-off time were recorded by two representatives of the CAA.

The course he had plotted stayed close to U. S. Highway No. 1, which leaves the mainland south of Homestead and bridges the islands from Key Largo to Key West.

Key West Radio was a beehive of buzzing talk that morning and an airline pilot in the vicinity was wondering out loud why he couldn't get a word in edgewise to make his position report. Vern circled the island until he could be heard and have his flight number checked off. Then he wiggled forward in his seat, planted his feet a little more firmly, and determinedly set his course out over the sea.

At 5,000 feet there wasn't a ripple in the air. The ocean seemed flat and calm, and the whitecaps were just white scratches on its dark metallic coat. Soon the brightly colored Coast Guard picket boat passed a mile underneath, looking like a small silverfish, and a little later a dark blob approaching from the horizon assumed the outline of an amphibian, the Coast Guard Albatross. The engine of the 172 never missed a beat in its steady monotonous throb, and gradually, Vern slid back in his seat and loosened his grip on the wheel.

Twenty minutes out of Key West, and halfway across the water, another Coast Guard ship passed below, and soon the faint outline of the Cuban coast appeared on the horizon. Vern had flown a perfect course. Havana showed a few degrees to the left of the Cessna's nose, and when the coastline came into sharp focus, the 3,000 foot turf strip of Sante Fe, the airport of entry for the tour, appeared dead ahead.

Cy Seidel of the Miami CAA office had preceded the caravan, and was on hand to check each flight in by number and direct the visitors to the special customs and immigration service set up on the field. After the last straggler was accounted for, the Coast Guard Albatross landed at the turf strip, and its crew joined the cruise party at a reception in the lounge of a local flying club.

Chauffeured limousines were waiting to take the visitors downtown to their hotels and, with time on their hands after their quick morning flight, they were free to roam about and explore the city. In the evening the group visited the Tropicana, one of the most fabulous outdoor nightclubs in the western hemisphere, where dancers materialize among branches of the trees, where you can win a Mercedes sportscar on a two dollar bingo card, and where the sound of the slot machines and roulette wheels in the background never ceases.

Sightseeing was the order of the second day. A car with a guide picked up the Burts and their friends at their hotel and drove them through the narrow streets of old Havana to beautiful Cathedral Square, to the magnificent capital building, the Presidental Palace and through University Town to Vedado and Miramar, two residential suburbs with sumptuous modern apartment houses and homes.

But the highlight of this year's Cuban tour was the flight inland to San Jose Del Lago, an idyllic cottage colony built around warm mineral springs near the small country town of Mayajigua. Lying in a sugar cane area near the north shore of eastern Cuba, Mayajigua is about 230 miles from Havana.

The route east from Santa Fe leads around the prohibited area of Havana, skirts a low but rugged mountain range north of Cienfuegos and crosses over the city of Santa Clara, the only outstanding landmark on the route. The Cuban flight chart is inaccurate in spots, and weather information for regions outside Havana is quite inadequate. The mountainous areas are scraggly and the plains thickly covered with forests of royal palms where they are not planted with sugar cane. Highways and railroads are scarce and not always accurately traced on the chart, and airports are few and far between. San Jose Del Lago has its own 2,300 foot grass strip on the east shore of its little lake.

On the morning of the Mayajigua flight,

(Continued on page 83)

With afterburner lit, a Crusader is catapulted from carrier deck during qualification trial. The wing is seen set at high angle.

Inflight refueling from an AJ-2 Savage tanker. Probe is evidently located on left side of fuselage, but was retouched by censor.

Chance Vought F8U-1 Crusader

First Navy carrier-borne fighter to exceed 1,000 mph, when in August 1956 Cdr. R. W. Windsor established with it a national speed record of 1,015 mhp, the Chance Vought F8U-1 Crusader has many unusual features. The most interesting is the variable incidence wing which is hinged at the rear and hydraulically raised at the front for take-offs and landings. This allows the fuselage to remain almost parallel with the deck or a runway at a critical moment when good visibility is paramount. As added advantage, a flush cockpit enclosure was achieved. The Crusader is powered by a 10,000 lbs. thrust Pratt & Whitney J57 with afterburner. END

Banked position shows up shape of the wing and the extended tip leading edges. The dark portion of the fuselage is titanium covered.

Low fuselage angle of the Crusader at take-off is evident in this photograph, as well as good forward visibility from the flush cockpit.

Above, center: Ralph Kappler enjoys the convenience of having his plane ready and waiting at his own front door. Directly above: Oregon Sportsmen Pilots enjoy softball game during a fly-in picnic at Kappler's field.

Every landing is a pleasure

By BETH THOMAS

THIS IS THE STORY of a man who strolled out of the Oregon woods swinging an ax of enthusiasm which enabled a pint-sized Oregon community to claim it's the "flyingest community in the country." The man is Ralph Kappler, a western Oregon lumberman; the community is Mulino, with a population of 600. A farm community, Mulino is located at the northeast rim of the Willamette Valley at the western edge of the Cascade Mountains, a scant 15 air miles from the historic site where Dr. John McLoughlin of Hudson Bay Company first settled on the banks of the Willamette River.

Ralph Kappler and Mulino got together by virtue of the fact that he was born, raised and went into business there and, while he was well known and respected as a business man, it wasn't until 1945 that aviation entered the picture. Ralph learned to fly. He was immediately enthusiastic and saw flying as a profitable venture in terms both of pleasure and business. He claims now that the idea of using a plane for business was particularly appealing to him because, "I'm no woodsman, and the prospect of looking at timber from top side seemed a lot better than bouncing over hot, dusty logging roads in a jeep."

The nearest field where he could take instruction was a few miles south of Mulino where at one end of a 1,575 foot strip was a discarded locomotive—always a first-rate mental hazard. Ralph attributes his current skill to those days of leap-frog training. He soloed a battered Porterfield and as he was making his first climbing turn, the left wing went down. He righted the craft enough to stagger into a landing and reported the trouble. Examination revealed that the wing was full of water! He decided to avoid poorly kept ships by buying his own. Thus in 1946,

Left: Looking southeast across Kappler's Mulino airport. Note the fine runways and excellent approaches. Below: Ralph Kappler with tractor and rotary mower used at the airport.

at this Port of Perfection

he became the first person in Mulino to own an airplane.

In the months that followed, Ralph had his second inspiration, the one that has so keenly affected the whole community. Realizing that much of the value of business flying lies in have a plane close at hand, Ralph decided to build himself an airport as near to his plant as he could. He found a 70 acre tract just off the main street of Mulino and only three miles from his office.

The tract was under option to a local farmer, but as the farmer could not then pick up the option, he surrendered it to Kappler in favor of the airport project. He agreed to help convert that land to an airport, but he insisted that four acres be set aside for his home, and if the airport failed, he was again to have the first option. If the port lasted five years, the farmer would agree that it had stood the test long enough to void his option. Ralph agreed to all of this, and today, the farmer, who doesn't fly, does however boast enthusiastically of the airport in his back yard and periodically goes up for a scenic hop.

To clear the land, it was necessary to remove 30 acres of oak, ash and other hard woods, as well as old fences and railroad ties. Considerable leveling had to be done, and at first Ralph used a D6 cat tractor which only an experienced operator could run; hence the work was slow. Later he used a Chev four by four to tow a 32-foot drag, and as anyone who could drive could operate the rig, the work moved more rapidly. When the land was fully prepared, the area was tiled with over eight miles or 40,000 feet of tile to make it a year-round airport.

While all this work went on, a wind sock was hung and closely studied to find the favoring winds, and crossed runways, each 2,200 feet long and 300 feet wide, were laid out to conform to prevailing winds. To simplify construction, Ralph decided that one side of the wide runways could be used for taxiing.

In July 1947, a year after he bought his Ercoupe, Kappler landed on his own strip, and his was the first and only ship on the field at that time. In 1949, after many business and pleasure trips in the Ercoupe, he came back home with a new Navion—the second ship to touch down on his field—for until then there had been local interest but no action. Soon, however, he sold the Ercoupe locally, and from then on interest grew and others followed the lead.

Only one rebuff marred the start of Kappler's field. A turkey grower, whose farm was located off the end of one runway, angrily complained that the planes would scare his flock, but in a week's time he came back to say the planes were no trouble, and he was thinking of buying a plane himself.

Although the field was adequate, Ralph had begun to look upon it as a hobby and a matter of pride, so he went right on to develop the finest private field that money and interest could devise. He consulted an agricultural agent at Oregon State College to find the best sod to withstand airplane traffic. Following the recommendations closely, he did a careful job of seeding, fertilizing and mowing. In time, mowing became a real problem. The grass grew so fast that it was difficult to care for it profitably and conveniently. To use a sickle-bar mower meant to rake, bale and carry off the cuttings. From some 25 acres the yield was 28 tons of choice Fescue grass—a particularly high grade hay. Cutting, of course, had to be done just at the right time which restricted use of the field. But the problem was licked with the use of an 80-inch double rotary mower (*Continued on page 92*)

J. C. "Cliff" Garrett

The Garrett Story

PROBABLY THE GREATEST effect of freedom over the years has been the release of imagination. Aviation came to the stage at a fortunate time in history. Its development in the United States has reached great proportions because it is in logical sequence with the imaginative pioneering of the country itself—170 years of experiment in free society, a creative accomplishment unmatched in history. Nor will the story of the land become an obituary so long as this flame of creative imagination burns brightly.

When FLYING assigned me the task of writing a series of sketches on notable aviation companies whose stature could not be set forth graphically in terms of airframes or powerplants, I suspected that the assignment would lead me to many examples of opportunity seized at the flood tide of demand. I was not prepared for the vast amount of foresight I have uncovered—foresight which itself created opportunity and then expanded it.

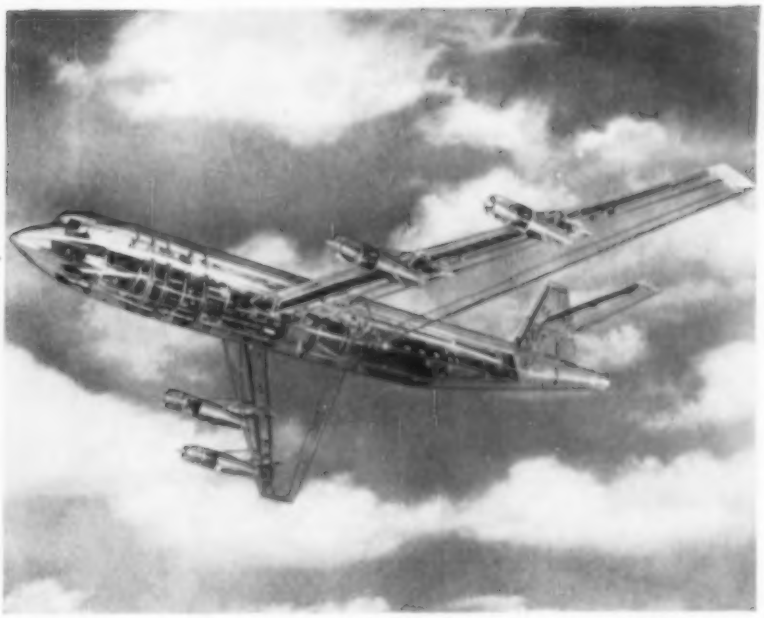
The subject of this sketch is The Garrett Corporation, a sprawling organization of diverse interests, each of which followed some other in business logic and all of which together have made a heady contribution to the development of aviation in the United States. For example, the number of "firsts" which have resulted from Garrett's research, development and production is significant. They range through the fields of air turbine refrigeration, pneumatic power, heat transfer, cabin pressurization, electrical power units and electronics. The end result of this "accessories pudding" is its vast utilization on aircraft. The company has produced more than two billion accessory articles with an average of 38½ Garrett components currently supporting each airplane, military and commercial, produced in the United States.

But before we set forth the network of creation and

The Garrett Corporation general offices and AiResearch Manufacturing Division located in 640,000 square foot facility at Los Angeles.

Imagination and creative ingenuity built The Garrett Corporation, an industrial organization which has contributed significantly to U.S. aviation.

By JOSEPH VOLNEY



Six foot long plastic model of AiResearch's "Jet Transport of the Future." Inside are exact miniatures of all AiResearch's aircraft components and systems which help now, and will in the future, cool and air-condition interiors and instruments at very high altitudes.

acquisition which composes Garrett Corporation, we must turn back the pages a little. The story behind the story of anything worthwhile is always a human story.

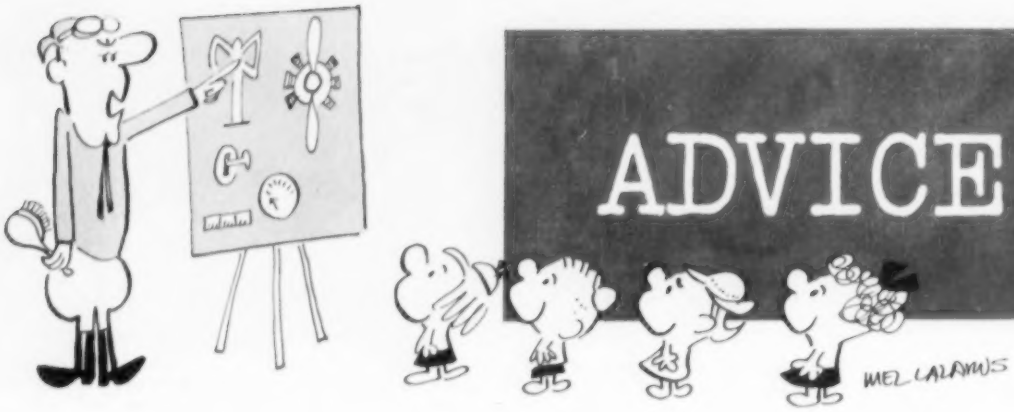
One day in the mid-twenties a student in Polytechnic High School of Los Angeles was called home from classes. His elder brother, a Naval officer and pilot of World War I, had crashed in the waters off San Diego. It takes no imagination to know what a place such a brother filled in the life of a high school boy. Among other effects, the tragedy called for a young fellow to take up the same cudgel. Thus in 1926, John Clifford "Cliff" Garrett enrolled as a freshman in the University of California at Los Angeles—target, a career in aviation.

Cliff had been born in Seattle, Wash., March 8, 1908, the youngest of three sons. The family on both sides of the house originally were Ohioans. In 1913, father and mother Garrett moved from Seattle to Klamath Falls, Ore., and in 1921, Cliff Garrett moved to Los Angeles.

The freshman year at UCLA was all that was in the cards for Cliff at the time by way of formal education. In 1927, he went to work for Lockheed, then located in Hollywood. In five years, he forged his way up through the shop ranks to Assistant Superintendent. In 1932, John K. Northrop, even then a well-known aircraft designer, established a new enterprise, the Northrop Corporation, as a division of Douglas Aircraft Company. This operation eventually became Douglas' El Segundo division. Garrett joined the new Northrop group in its initial year as assistant to the president, in charge of procurement, and remained until 1936, when he made the decision to start his own company, the Aircraft Tool and Supply Company, in the Los Angeles area. This company was one of the first organizations on the Pacific Coast to employ designers expressly to engineer tooling (*Continued on page* 78)

Above: The Phoenix, Ariz. plant of the AiResearch Manufacturing Division. At the right: The 100,000 square foot hangar of AiResearch Aviation Service Division.

Airports and small children just don't mix. Here are some basic procedures on how to handle the little dears when they come for that plane ride.



ADVICE TO

WHEN MOPPETS AND AIRPLANES tangle, the results can vary from sublime to catastrophic. To keep the latter eventuality to a minimum, some practical pointers from a harassed father with copious experience, may be of value. Whether you are committed to flying your own offspring, or cornered with the prospect of playing Daedalus to others, certain pre-planning is imperative—at least, equal in degree and caution to that of an atomic bomber pilot. Understandably, the Civil Aeronautics Administration has lacked the courage to incorporate moppet procedures into a manual. They have no desire to author a revolution. Flying fathers are on their own. As one of them, I feel a deep responsibility to the cause. The following, while by no means complete, will at least indoctrinate the unwary and perchance save some from premature senility or even immediate insanity.

When the cherubs arrive at the airport, immediately establish discipline. This can be accomplished best in the parking lot after the chorus of "There's an airplane," has subsided. A short lecture should be given on how easily an airplane can be damaged by the patter of little feet on wings and tail. A casual toying with a hairbrush or monkey wrench at this point is recommended. Be especially careful to explain how the nasty old propeller loves to bite off little arms and craniums. Impress upon your darlings the importance of not touching those switches, levers, and thing-a-ma-bobs in the cockpit. Explain that one of them is wired to an atom bomb in the tail and will blow the brat—er,—child, sky high if he as much as looks at it. Thanks to television, this item will be promptly believed by 90 per cent of the junior set. The remaining ten per cent may require a modicum of applied child psychology. A threat to hang the disbeliever out the window by the thumbs, once in flight, works generally well for the writer. With ingenuity, other workable systems can be arrived at. Always caution the smaller demons about grasping the controls on take-off or landing. Above the age of 7, they generally know better, but if in doubt, shake it into them before leaving the ground. If flying a fabric-covered airplane, remove pocket knives and other potential fabric testers before proceeding to the line.

When conducting your charges from the parking lot to the ramp, lag slightly behind to keep all in view all the time. We stress the "slightly" unless you are capable of running the mile under four minutes. Avoid all distractions such as blondes and old friends. It is no end embarrassing to call for a ladder to rescue a moppet from the nose-wheel compartment of a DC-6 or the Unicom antenna over the office.

After arriving at your airplane, line the formation in single file at the wing-walk, youngest first, and instruct the oldest at the rear end of the line to tackle any who try to duck under the fuselage. Attempt to arrive in the cockpit as nearly simultaneously as possible with the first passenger. Belt him or her in, as the case may be, until the face starts to turn slightly purple. With luck, this will hold until the others are seated.

If a line-mechanic is available, have him check the external control surfaces for dolls, roller skates, etc. Under no circumstances leave the airplane to do this for yourself. There is a good possibility that it will depart without you! Recheck the cockpit, roll down a window or open the ventilators wide, and start up. Don't be too obvious as you throw the master switch and hit the starter. The younger generation learns altogether too fast. The purpose of opening the window or ventilator is to give the passengers in the back seat a good blast of dust in the eyes. If done correctly, this will occupy them sufficiently to enable you to taxi into position and run-up without further distractions. Before turning into the runway, check all belts, loosen slightly the belt on the empurpled one, and bite the fingers of the kid reaching for the trim-tab crank. Make your customary checkout at least three times, as you will naturally be rattled, and the urchin next to you may have been amusing himself by turning the gas valve to "off," while you were checking the back seat. When the situation is as right as it ever will be, get into the air, and gain altitude rapidly. Turn away from congested areas in case a flare is pulled.

If the flight is to be of any duration, comic books should be provided. Discourage all attempts to throw things out of the windows by (a) closing them, or (b) rapping the

By HUGH DORWORTH

FLYING FATHERS

offending fist with a chart ruler. If tools have been kept in the back seat, you will of course have removed them to a safe place. Some dismantling of the airplane is bound to occur. A friend of mine left a small screw driver in the rear side pocket. His four-year-old wrecked a power supply beyond repair in slightly over 15 minutes—a world record for rear seat destruction—novice class.

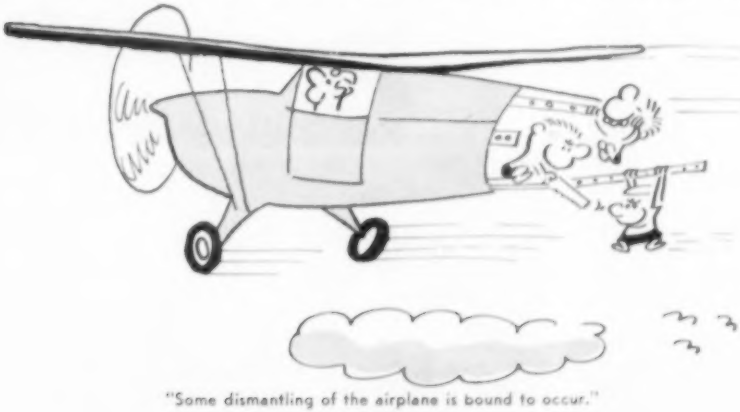
Avoid attempts to settle fights unless serious maiming is due to occur. Keep alert, watch for another aircraft. Recheck the panel and gas valve position whenever attention is diverted to the rear seat. Most younger children fall fast asleep after a few minutes in the air, but don't count on it. Older children grow increasingly more difficult as the flight progresses. If you lose control completely, shut off the cabin heat and climb until the cold partially immobilizes them. Acrobatics, as a method of stopping fights, is to be avoided. The pilot gets airsick and the kids whoop enthusiastically for more. As a last disciplinary resort, allow each child a turn at the wheel—but only if a competent co-pilot is along. He will be needed to right the airplane while you pry ten little fingers off the wheel.

Repeat your usual landing check-off, a minimum of five times to counteract the unusual mental and physical strain. Check all belts before entering the pattern, and re-belt where necessary, tying the end around the wrists to avoid further trouble. Recheck the situation on the

"Comic books should be provided."

downwind leg, and turn the gas valve back to the "on" position. Keep alert, watch for other aircraft. When down, taxi to the line, and park with the tail toward the parking lot. Cool the engine well before shutting down, and evacuate the craft as quickly as possible. From this point, employ the pre-flight procedure in reverse. If possible, have your wife drive the car home, while you work off nervous tension in the back seat by paddling the worst offenders.

To grow serious for a moment, airports can be dangerous for the little ones; and are second only to an amusement park in attraction. The hangar ramp is no place for children to play, yet parents who should know better sometimes bring junior's tricycle along and permit him to pedal around the tarmac. Since children come in small sizes, they are extremely hard to see. If any are around the hangar line, be extremely cautious in starting up. (*Continued on page 72*)



"Some dismantling of the airplane is bound to occur."

The student gets first hand information from tower personnel.

By placing aircraft utility under a microscope for his inspection, a new flight program provides

Flight Briefing for the Businessman

By EMMETT ROBINSON and ED WHITE

Half of each session is devoted to flight training in Cessna 172.

Cross-country flight planning is included.

The student learns how to check the weather.

Communication is outlined by a CAA specialist.

"NOSE DOWN a bit—now level off and let her down easy." No pilot will fail to place these words in their proper context—the early phase of flight instruction.

But one might be surprised at the significance they have in Memphis, Tenn., where they are introducing a special class of businessmen to commercial aviation and spearheading a job of public relations. The program is called, "Flight Experience Course for the Businessman."

The four-hour indoctrination is the brainchild of Dal Miller, President and General Manager of Dixie Air Associates.

In building an organization for service to executive aircraft, Miller discovered that many of his best potential customers were living in a state of "aviation illiteracy." He and flight training director, Troy Ritchie, sought a solution for this condition. The nearest example was the University of Illinois course for educators. With this as a starting point, they worked out a program which is drawing enthusiastic response from local businessmen with transportation problems.

The Flight Experience Course does not teach the businessman to fly. Rather, it puts aircraft utility under a microscope for him to inspect. The customer covers the curriculum during four one-hour (*Continued on page* 76)

An average of 40 times a day, Guard pilots scramble on orders from Air Defense Command to investigate "suspicious" or "unidentified" targets.

Home Folks on Guard

In a single decade, the Air National Guard has established itself as a prime combat-ready organization.

By BOB FINNEY

WE HAVE NO OBJECTION to the term "Weekend Warrior" provided it is not used to connote a weekend interest in the national defense: or a secondary ability to defend.

The concept of the citizen soldier in American history runs from the squirrel rifle of the Colonial to the supersonic jet aircraft of our times and has a long and proud tradition—but never prouder than today, when the devotion and professional skill of the Air National Guard is a tower of strength in the land.

Following World War II and the advent of jet power, there was great scepticism that the citizen soldier would be able to carry the double burden of his civilian occupation and the professional requirements of supersonic combat. Yet he has done so and in sizable strength is today standing watch in permanent status in continental defense. As a major element of our alert system, at 20 Guard air bases, some 100 pilots and several hundred guard technicians are on a 14-hour per day sentry go at runway's end—their job to intercept should another "Pearl Harbor" threaten atomic devastation.

An average of 40 times every day, Guard pilots scramble on orders from Air Defense Command to investigate "suspicious" or "unidentified" targets. Usually, the targets are careless pilots who fly into critical areas—Air Defense Identification Zones—without proper clearance. But the sentry pilots never know when their missions may turn out to be "the real thing."

This is the first time that any U.S. air reserve component has ever been employed in active continental defense and permanent ANG participation in the Air Defense Command's standby-alert program came only after two years of experimentation. In August 1954, 17 ANG squadrons were elected to provide the runway-ready planes, and the volunteer pilots and technicians—on short rotating active duty tours. There was considerable cynicism that the Air Guard could do the job capably or eco-

Korean ace, Capt. Clifford C. Jolley of the Utah ANG.

ANG Col. Willard S. Millikan is greeted by family and Lt. Gen. Leon Johnson after record flight.

Calif. ANG's Lt. Jack Conroy first to round-trip the continent between sunrise and sunset.

nomically. The Air Guardsmen did both, and have not only gained permanency in the program, but elicited praise from their confreres in the Regular Air Force.

Air Force Secretary, Donald A. Quarles recently said, "During the past six months, Air National Guard pilots took to the air on almost 5,000 alert flights. If we could not count on the Air National Guard for instant readiness, we would need a larger Air Force, and the costs of defense would be much greater . . ."

Other Duties

In addition to its active defense role, the ANG is charged with being prepared for immediate combat-ready mobilization in event of a national emergency. Constant test of the Guard in this respect is carried out. Operations Minute Man, Stopwatch, and Cracker-jack, staged over the last several years, have called on various segments of the Air Guard without warning to learn how long it would take them to get into action. The results of these operations are classified, but we can authoritatively report that the Guard's 2,100 planes—1,565 jets, and 535 other conventional fighters, bombers and transports—along with the people who man them, have not been found to be foolish virgins with their lamps untrimmed!

How has the Air National Guard achieved such a stature and state of readiness in the single decade since its organization after World War II?

Probably the most significant reason for the Air Guard's success is the stability of its bases and the people who operate them. A man who lives at home in his native surroundings and is a part of his permanent community should do a better job than one who is in a temporary environment, as is the case with most military personnel. Additionally, permanency in a specific job within a single unit, and long-standing comradeship with lifetime friends—advantages employed by the Air Guardsman—contribute to maximum operational efficiency. This has been affirmed repeatedly by observers—Government, civilian, and military—who have said that Air Guard planes and equipment get as good or better care than those of the regular Air Force.

A second factor in the Air Guard's success story is the pride of accomplishment spurred by friendly rivalry with units of the regular establishment. Each year, the best fighter-gunnery team in the Guard, determined by an annual inter-ANG meet, competes among the best teams of the regular Air Force. In 1955, the ANG team finished third in the competition. Last year, they finished fourth in a field of six after scoring second in the air-to-ground phase of the meet.

In the continuing effort to acquaint the American people with the forward strides being made in military aviation, the ANG is often first with important evidence of progress. On Armed Forces Day, May 21, 1955, John M. Conroy, of the 115th Fighter-Interceptor Squadron, Van Nuys, Calif., focused national attention on the jet age by being the first man in history to speed eastward from coast-to-coast and back again between sunrise and sunset. In 1954, the commander of the Washington, D. C., ANG 113th F-I Wing, Col. Willard W. Millikan, flew an F-86 from Los Angeles to New York to set an official eastward coast-to-coast record of 4:07 hours. Both stirred popular imagination and were recorded as "firsts" well in line with the tradition of Burton Ely, an original "guardsman" who introduced the concept of aircraft carrier potential to the Navy.

Out in Colorado, the 140th F-I Wing of the ANG has developed a jet exhibition flying team—the Minute-Men. The acrobatic abilities of the team are rated on a par with Navy's Blue Angels and the Air Force's Thunderbirds. Another demonstration of ANG capability is the Ricks Memorial Trophy Race. This test sponsored by the Air Force Association and named for the late Maj. Gen. Earl T. Ricks, Chief of the Air Guard from 1950 until his death in 1954, is a cross-country competition emphasizing flight-planning and high-speed cruise control techniques.

ANG in Korea

Then there's the record which the ANG hung up in Korea. When that war started, the ANG had about 90 per cent of the fighter strength in the continental United States. The Air Force was concentrating on bombers. Most of its fighters had been scrapped. As a result, 45,000 ANG officers and enlisted men in 19 fighter wings, two light bomber wings, and one tactical reconnaissance wing—66 combat squadrons and 398 support units in all—went to active duty. Two wings—the 136th of Texas, and the 116th of Georgia—went to Korea intact, with their own airplanes. Many other ANG pilots went as Air Force replacements. The rest served in the United States and Europe.

The Korean score? Four ANG pilots became aces—Maj. James Hagerstrom, Texas; Maj. Robinson Risner, Oklahoma; Capt. Clifford D. Jolley, Utah; and Capt. Robert J. Love, California. ANG members were awarded 1,300 citations, medals and honors, from the DFC to the Purple Heart.

Some famous men who started in the Guard add to the pride of its accomplishment—Col. Charles A. Lindbergh, Gen. Walter Bedell Smith, Gen. Nathan F. Twining, Governor Joseph Foss of S. Dak., and Senator Harry Goldwater of Arizona—just to example a few.

Probably nearest to the Guardsman's heart is the local service he is able to render to the citizens of his community—mercy missions which he is called upon to perform—flying help to individuals or epidemic-threatened groups, transporting ill and wounded, dropping food to blizzard-bound farmers or performing a hundred and one other chores which make life more livable to the people with whom he rubs shoulders in daily life.

So it all adds up—the national stature, the permanency of station, the consciousness of local service—to an esprit de corps within the Air Guard that is notable, even in a profession where morale is essentially the heart and soul of effectiveness.

An example is the 147th F-1 Squadron of the Pennsylvania National Guard. Based in Pittsburgh, the squadron is nicknamed "The House of Sam." It has its own squadron song, distinctive plaid helmets, belts, scarves, etc. Also it has millions of yellow stickers which proclaim "Never fear—a Sam is near!"—and it has pasted them around the world.

The Sam business started accidentally when a radio interviewer asked a squadron pilot for his name. The pilot replied tiredly, "Just call me Sam." Before you could say "Sam," everyone was calling everyone, Sam. Prefixes popped up, like "Ditching Sam" for the pilot who went down in Chesapeake Bay and "Oh no, Sam" for the guy who breathed "Oh, no!" into his mike when he inadvertently landed wheels up. All this elaborate foolishness has a serious aim—to boost morale . . . and it works.

Colorful History

In case accomplishments of the ANG during its recent ten years is not enough to explain the inspiration and devotion evidenced by Air Guardsmen, a brief glance at the colorful history of the Air Guard before 1946 will be helpful. Like the Air Force, the ANG has an army heritage which goes back to the early days of aviation history. As one example, the First Aero Company of the New York National Guard was activated in 1916. Shortly after Federal recognition, it entered Federal service, was designated the 26th Aero Company and served throughout World War I. Its commanding officer at the time it entered active service was Maj. Raynal C. Bolling, for whom Bolling AFB, Washington, D. C., is named.

Between the World Wars, 19 Observation Squadrons were formed within the National Guard, starting in 1920. Just before World War II, the number was upped to 29. These 29 squadrons went into Federal service in 1940 and 1941, and their personnel were scattered around the globe throughout the Army Air Forces of World War II.

When war ended, the National Guard was completely reorganized and with the severance of the Air Force from the Army in the summer of 1946, the Air National Guard as it is known today was born. The first ANG unit was the 120th Fighter Squadron of Colorado. At the time there was grave doubt that the ANG would ever be able to maintain such "tremendously complicated" aircraft as the F-51's, F-47's and B-26's which were the mainstay of the Air Guard's fighting force. Downgrading of Guard potential was an old, old story in American military history. Old airmen smiled to remember a ponderous pronouncement by an Army spokesman in the early days of aviation. He said, in effect, "It is impossible to think that voluntary workers (Army Guardsmen) can maintain and repair the intricate and elaborate mechanisms of Aero units. Time will tell, but so far reason and experience show that the Army's aviation service and the National Guard have no common interest. National Guard Aero units could never be maintained or organized in peacetime."

So the Air National Guardsmen of today, as did their predecessors of bygone times, just go on proving that if a man is good enough to be a Guardsman, the word "can't" isn't in his dictionary. END

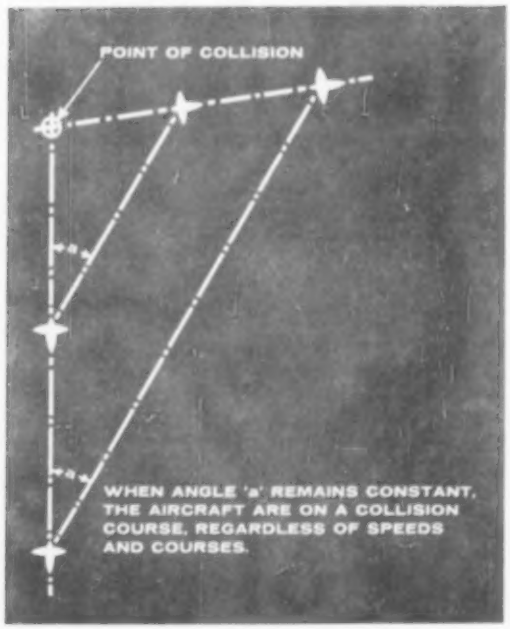
THE PRO'S NEST

By observing certain rules and practising proper procedures, while flying along our busy airways, you can

Avoid mid-air collisions

By ELSTON H. SWANSON

Aircraft on a collision course.



MUCH HAS BEEN SAID of late about mid-air collision, especially since an increasing number of aircraft are taking to the air, flown by professional and non-professional pilots alike.

From the standpoint of the lightplane pilot, there are two distinct angles. He may encounter both, or only one—flight under instrument flight rules or visual flight rules. The problem of avoiding en route collisions while flying under instrument conditions is one of air traffic control, assuming everyone operating under ATC clearance is where he is supposed to be at all times, and will not be dealt with here. The problem under visual flight conditions is the more acute, since statistics show that the vast majority of collisions aloft occur in good weather.

Furthermore, since this discussion is intended to provide information and generate thought on the part of pilots, nothing need be said about the advantages of improving visibility from present day cockpits, particularly in transport type aircraft where the deficiency is acute. This is a matter for the aircraft manufacturers.

While there is no substitute for continuous vigilance, there are certain practices and rules which may be applied to curtail the frequency of mid-air collisions, and these will be treated.

In terminal areas the most neglected practice is that of scanning the area into which a turn is contemplated before initiating the turn. Many pilots feel that, because they are following the prescribed procedure in entering a traffic pattern, everyone else is either preceding or following them. This is a dangerous assumption, as has too often been proven. There are always pilots around who are not familiar with proper traffic procedures at a given airport, to say nothing of the occasional one who deliberately utilizes any flight path he prefers. Looking back as well as forward through the entire area into which you intend to turn is cheap insurance. With high wing aircraft, it is a good idea to lift the wing for a view of the blind spot just above it in the intended direction of turn. If the intended turn is a long one, more than 90° for example, it is well to momentarily interrupt the bank and once again check the air space into which you are bound.

Many pilots do not know how to estimate whether another aircraft observed in flight will pass above, below, to right or left of them. These rules should be remembered.

1. Any other aircraft at your altitude will appear to be on the horizon. If it is above the horizon, it is higher than you are. If it is below the horizon, it is lower than you.

2. A collision course between two objects moving in a straight line must of necessity be a relative constant angle course. Therefore, if you see an aircraft whose angle, whatever it may be, whether off to the side or directly in front of you, is unchanging, either you or he or both had better think about turning. The diagram illustrates this rule.

Extending Rule No. 2, it may be seen that if the angle to another aircraft is changing slowly, the aircraft will pass closer to you than if the angle were changing rapidly. Any evasive turn you make should be in such a direction as to increase the change of angle. For example, suppose an aircraft is sighted on the horizon at 45° to the right of your aircraft nose. Also, suppose after observing this aircraft, the angle from the nose of your airplane is seen to decrease slowly. Under these circumstances the proper turn would be to the right, since this would increase the change of angle. In the absence of any other overwhelming information, all evasive turns should be made to the right. This is the general traffic rule.

However, assume an aircraft on the horizon 45° to the left of your aircraft's nose, with a decreasing angle (i.e., the other aircraft seems slowly moving toward the nose of your aircraft), if he does not (*Continued on page 66*)

Above: President of Guatemala, Carlos Castillo Armas, wearing sunglasses and visored cap, and Jerry DeLarm, hatless with his back to camera, confer during a lull in hostilities. Below: Group of anti-communist mortar men in the hills prepare for another clash.

Jerry DeLarm drops supplies over rebel headquarters at Chiquimula.

"SULFATO"

NEMESIS OF GUATEMALAN REDS

The rebels' clandestine radio kept loyal Guatemalans informed.

Now it can be told that an American pilot played the leading role in the Guatemalan revolt against the Communists.

By DOUGLAS LARSEN

LATE IN THE DISMAL afternoon of June 17, 1954, an unmarked DC-3 poked its nose through the overcast which blanketed Guatemala City. As it growled in low circles over the center of town, clouds of leaflets trailed out behind. Citizens in the streets, already near panic over an impending revolution, pointed skyward shouting, "Fantasma, Fantasma!" phantom plane. Piloting the DC-3 was 33-year-old Jerry Fred DeLarm, a native of San Francisco, a veteran of the U. S. Army Air Corps and one of the most romantic characters in Central America. His .45 automatic twisted to hang over his flat stomach, so that it didn't interfere with his seat position, Jerry was turned to shout directions to three men in the cabin who were busily tossing out propaganda leaflets.

"Cut the wire on the bundle before you kick it out!" he yelled, trying to be heard above the roar of the engines. One of the trio waved acknowledgment. But at that instant a bale of the leaflets fell from the open door with the wire uncut, plummeting toward the ground. Jerry grimaced when he saw it, but his attention was diverted by the fuel gauge which indicated that he must head back to the clandestine strip from which he was operating.

It's one of those quirks of history that the uncut bale of leaflets should trigger a train of events which would make Jerry a key figure in a revolution the whole world was watching, and end with Guatemala being the first country in history to come out from behind Russia's Iron Curtain.

The untied bale fatefully landed with a crash in the courtyard of the National Palace just outside the office of Red President, Arbenz. When Jerry's plane had first begun circling overhead, all of Arbenz's staff had gathered in the yard to watch. Then when the bale crashed among them, bursting its wires and sending up a shower of paper, they dispersed as if by magic.

"It was just as though the courtyard had been given a giant dose of epsom salts (sulfato)," a witness graphically told a crowd of citizens in the street. The "clean 'em out" remark assumed psychological portent in Guatemala City and "Sulfato" became Jerry's permanent nickname.

Only now several years after the revolution, can the details of DeLarm's role in the Guatemalan revolution be told. The Guatemalan patriots concerned have been fearful that if the story were revealed earlier it would have been fodder for the Russian propaganda mill which leaps on any detail as evidence that the U. S. is meddling in the affairs of Central and South America. Now, however, the record of the Reds' own efforts to seize Guatemala is so well known that Red charges are immaterial.

Jerry's part in the revolution began about 18 months prior to his first leaflet dropping mission. During that period he worked secretly for Col. Carlos Castillo Armas, the Guatemalan patriot who was dedicating his life to throwing off the yoke of Communism which the Russian stooge, Jacobo Arbenz Guzman, had imposed on the country. DeLarm's assignment during that period was to help build a secret air force for the day of revolt against the Reds. He was perfect for this role, by background and experience. His dad was a pioneer pilot, Eddy DeLarm. As a youngster, Jerry flew co-pilot for him, lifting cargo around Mexico. Thus, when World War II rolled around, the boy had several thousand hours, and was living in Panama City, flying co-pilot for a commercial airline. He spoke Spanish like a native, and knew the countries of South and Central America like his own back yard.

During the invasion of Saipan, Jerry shot down two Jap planes. "That guy's the coolest combat pilot I've ever seen in action," Col. Ralph Acton of the Air Force recalls of Jerry. After Saipan, DeLarm spent another year in the Pacific on strafing missions to Japan and escorting B-29's. Discharged at the end of the war as a captain, Jerry returned to civil flying and set up an airline in Costa Rica, when soon began making money. His wife was related to a former President of Costa Rica, Dr. Caledron-Guardia and appeared that he was on the high road to become a wealthy airline executive and family man.

But one day in 1948 his famous in-law, Dr. Caledron-Guardia visited him. "Jerry," the doctor said, "I'm afraid I have bad news. A group of left-wing politicians are planning a revolution against us and we need your help."

"Anything you want, I'll do," Jerry promptly offered.

"We'll give you the temporary rank of colonel. See what you can do to fight these pinkos," the doctor suggested.

"I took one of our 'Dougs,' put a machine gun in the co-pilot's seat, mounted guns at each window, knocked the floor out of the toilet in the rear and installed a gun there for ground strafing. The man who handled the toilet gun sat on bags while he fired but, in spite of the sand bags, I lost two toilet gunners," he recalls regretfully.

The action of that Costa Rican revolt lasted 50 days, but in spite of Jerry's efforts his side lost steadily. "The night the pinkos finally won, I had just time enough to get my wife and her relatives aboard (*Continued on page 86*)

CANADAIR ARGUS First Canadian-built submarine hunter killer aircraft is named after the "100-eyed" giant of Greek mythology. Although it is a basic development of the turboprop Bristol Britannia, the original design has been extensively modified for the necessary military equipment and long range at low level and moderate speed dictated by its special tactical mission. The Argus is powered by four Wright Turbocompound engines of 3,500 hp each and has a range of over 4,000 miles. The chin-like bulge and stinger tail carry extensive electronic detecting devices. Large bomb-bay holds depth charges and bombs. Wing span is 142 ft. and fuel capacity 6,700 gals.

TILT WING Designed and developed by Vertol Aircraft Corp. for the U.S. Army and in cooperation with the Office of Naval Research, Vertol 76 represents the tilt wing family of vertical take off and landing aircraft. The entire wing-propeller unit can be rotated 90 degrees, to vertical position, as shown in upper photograph, whenever helicopter performance is required. When wings and propellers are in horizontal position, lower photograph, the craft flies like a conventional fixed wing airplane. Power is provided by a Lycoming T53 gas-turbine engine of approximately 1,000 shp which drives the two large diameter contra-rotating propellers. Two ducted fans, located in the tail section, control yaw and pitch in hovering flight.

EMERAUDE French two-place personal plane which will be used by U.S. pilots on a flying tour of Europe this summer organized by the Compagnie Mondiale de Voyages (World Wide Travel Co.) of France. Three separate tours will be conducted, leaving New York, Boston and Chicago on July 7, August 9 and September 11 via Air France on Super G Constellations bound for Paris. There, CMV will make available to the participants ten Emeraude lightplanes for group flights to cities in France, Belgium, Holland, Germany, Switzerland, Italy, Spain and Portugal. Every effort has been made to assure the flying visitors the utmost in safety, enjoyment and protection including liability and accident insurance in the amount of $28,000 per person. The ten Emeraudes, with two tourists in each, will be led on the cruise by a flight group-leader and accompanied by a staff of mechanics. Each lap will not exceed 200 miles in distance and all flights will be made during daylight hours only. The Emeraude is of all wood construction with plywood skin covering and is powered by a 90 hp Continental engine. It has a wing span of 26 feet 3 inches and weighs empty 776 lbs. Cruising speed is 118 mph, range 375 miles. Planes for the tour will be equipped with VHF radios, artificial horizons and ADF's in addition to the standard aircraft instruments. All ten were specially purchased by CMV for the occasion. Length of each tour is approximately three weeks. The itinerary of each tour is different, and the cost includes use of planes.

HAVE YOU SEEN?

ALOUETTE II French gas turbine helicopter for which Republic Aviation Corp. has recently acquired manufacturing rights from Sud Aviation of France. Powered by a 360 hp Artouste II turbine, it carries five, cruises at 110 mph and has a range of 300 miles. Because of its high power to weight ratio the Alouette has a substantial payload and as power loss of a turbine at altitude is not as great as that of a piston engine, it has a ceiling of 26,000 feet. One of the helicopter's unusual features is the absence of throttle. The engine is equipped with a speed governor and power limiter. Power output is automatically varied when changing blade pitch with collective pitch control.

Golden Rule Airport

By RUTH and DON DOWNIE

If you drop in at this airport short of gas and find it deserted, do not leave, read the sign on the pump.

THERE'S NEVER BEEN A LOCK on the airport at Barstow, Calif. Gas and oil, telephone, tools and the petty cash box are available to every transient pilot —whether the operator is there or not. Ever since World War II, Paul Pierce has been operating the Barstow Airport on an airman's honor system. And it works!

"I have a one-man operation here," explains Pierce. "If I'm out on a charter trip or giving dual instruction on some drylake 50 miles from here, who would pump gas? And next to water, the most important commodity in the desert frequently can be gasoline."

Barstow is midway between San Francisco and either Phoenix or Winslow. It is also the only gas stop before reaching Los Angeles from Las Vegas.

Instructions are simple. A faded typewritten sheet thumbtacked to the small wooden gas pump shack reads: "Transient pilots—Notice: Need fuel? Help yourself. You may refuel your aircraft in my absence. The airport facilities have been left available to you. Please cooperate so that this accommodation may be continued. Here's how. Please follow directions. Turn gas pump handle back to zero. Write down gallonage figures before and after pumping. Please make sales slip out completely. Carelessness costs me money. Scale of prices on wall. Please leave cash in the correct amount. If correct change is not available, I trust you to send it. Tie down your plane if you leave. Don't prop yourself without taking proper precautions. Use chocks. And now, if you are not too put out, please accept a coke on the house (refrigerator). My sincere thanks, and apologies for not being on hand. Come back. I'd like to know you."

When asked just how this Golden Rule approach to aviation has worked out, Mr. Pierce smiles and testifies, "In all the years I've had this gas pump open to any traveler, I don't think I've ever been gypped intentionally. Once in a great while I'll lose a few dollars through someone's carelessness, but not often. I believe in the inherent decency and dignity of man." END

Above: Barstow airport as seen from the air. Main runway is 2,800 feet long. Left: Paul Pierce, owner and operator. Below: Cessna 140 in front of the gas pump without lock. Pierce lives in the house in the background.

The Link F-89D jet flight simulator. Pilot and radar operator sit in the front and rear cockpits (foreground). The flight instructor's panel is at the right center and the radar instructor is seated, upper left, at his bank of controls.

A mechanical brain which can simulate every situation a pilot might meet in flight now makes it easy for you to

Learn before you weep

By BEN PREEC

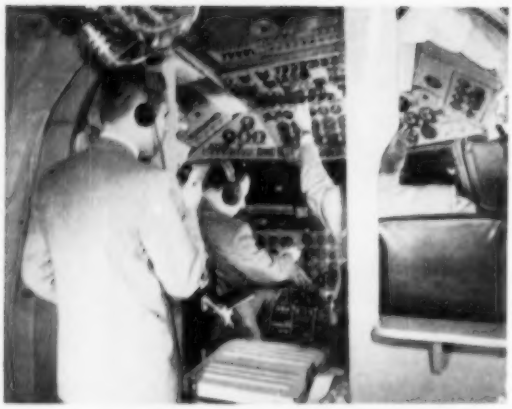
IN THE CEASELESS SEARCH that embraces the utility of the sky, few avenues have produced more profit and safety than the so-called simulator.

An airline pilot recently remarked to me that he had just completed the most enlightening flight of his career. When I asked where he had been, he replied that he had been through every contingency that flight and weather could contrive—in a simulator. "And I've never had such a reading on myself as a professional pilot." He added, "No possible combination of circumstances aloft could ever be so instructive."

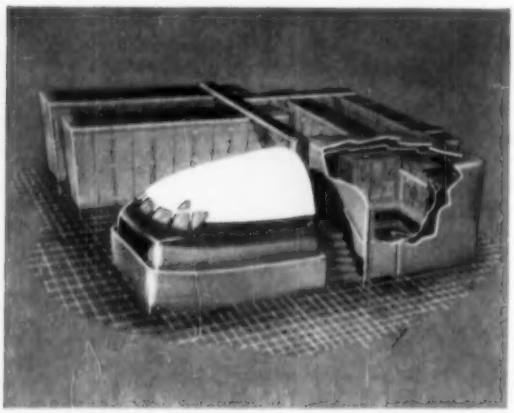
But the simulator has already gone far beyond its originally intended role as a pedagogue. It is as much the friend of the designer and the manufacturer as of the pilot. The accident investigator determines the conditions aboard a plane at the time of the accident and, setting up these conditions on a simulator, learns the how and why of the disaster. There are simulators to duplicate the flight characteristics of guided missiles; simulators to duplicate the celestial patterns of sky at any hour around the whole surface of the globe; simulators that show an aerial gunner how to target his enemy from any angle; simulators to familiarize crewmen with the electronic gear aboard their craft.

Design induced error once plagued manufacturer and pilot alike. Even in the greatest of aircraft, some slip of design ingenuity could lead to eventual trouble under certain contingencies. A design induced error occurs when control levers are placed too close together, or when dials are hard to read or distinguish from one another, or when switches are inconveniently placed. Even the grand old workhorse, the DC-4, originally had two levers which were hard to tell apart during the hectic seconds of a landing. One raised the landing gear and the other the flaps. On one occasion at least, a mistake led to an accident. In the B-57, pilots have been known to cut the engines when they intended to switch fuel tanks.

A design-induced error in several modern fighter types is a real lulu. When taking off, pilots are required to change radio frequencies after becoming airborne. To do



Curtiss-Wright DC-6B simulator cockpit looks like the real thing.



DC-8 simulator built by Link for United Airlines and Douglas.

this, the pilot must take his right hand off the control stick, turn his head and reach down at his side, to adjust the radio. Consequently, righthanded men are flying with their left hands and are not free to look ahead. This has resulted in accidents.

The tragedy of design-induced pilot error is that it never shows up until the plane is flying. Often it takes an over-fatigued crew or a situation in which the pilot must act in a tenth of a second to reveal a design error.

So, it is no light thing that today the aircraft manufacturer has a new friend in his battle to make planes and flying ever safer. The electronic flight simulator now reveals possible errors while the plane is still on the drawing boards. For example, Douglas Aircraft Co. is using one for final designing of the cockpit of their new DC-8 jet transport. Experimental crews will man the simulator for many hours at a time, facing all sorts of emergencies until they are completely fatigued, when probably, if ever, they will make the error that could have been prevented. If this happens, Douglas will analyze the error and find out if it could have been averted by design ingenuity. The Company has already made some decisions which will prevent future accidents. The number of instruments has been cut without cutting flight safety. Manual controls have been designed around the "sense of touch" philosophy. Some controls are shaped like the parts they activate—circles for wheels, rectangles for flaps, etc. More changes will probably come after experimentation with the flight simulator.

The hooded box which was the Link trainer during World War II was an early simulator, but very primitive compared with today's models. Modern ones built by Link, Curtiss-Wright, Engineering & Research Corp., and Westinghouse, can do everything a real airplane does except fly. Pilots who have trained in them might even argue that they do fly, since the controls have the actual "feel" of a plane, and the sensation of flying through all types of weather and maneuvers is extremely realistic.

The instructor can simulate a wing on fire, hydraulic failure, landing gear stuck, flame-out, engine fires, rough air, pitot tube or wing icing, oil pressure failure, fuel leak, radio failure, and many other "accidents." Recently, a strategic bomber crew was "flying" a simulator mission. All had gone well until they had returned to base and were preparing to land. Then the instructor decided to play a joke. He flicked switches and cut out all engines on one side of the plane. It was so sudden that the surprised crew couldn't recover, and the "plane" crashed.

This started the pilot to thinking. What would he have done during an actual flight if this had happened. He asked the instructor to cooperate and they went through the "accident" again. They repeated it time after time until the pilot was sure he knew what steps to take to save himself and his crew under even this unlikely condition. Weeks later this pilot actually had three engines flame out on a real flight. The simulator had taught him what to do and he did it. The plane landed safely.

Business and airline pilots have found that simulators offer many advantages. The expense of actually flying during training is eliminated to a great extent; congestion of air traffic is reduced; and weather ceases to be a factor in training. In a simulator you can have your weather at will. The simulators too provide longer training periods than would be possible in operational planes—up to 18-20 hours a day, seven days a week. One such simulator set a record of 1,046 hours of use with only one hour out for maintenance during that period. That amounts to better than a solid six weeks flying time. Match that in an airplane with only one hour of maintenance!

A breakdown of the F-89D jet flight simulator will give a good idea of what goes into one of these modern miracles. There were better than 8,000 engineering drawings, over 55,000 square feet of tracing paper, 30,000 square feet of blueprint paper. The simulator weighs more than 19 tons, takes enough power to heat two six-room houses, has over 1,635 electronic tubes, or enough to build 82 television sets. There are also 225 parts from the actual aircraft, five radar scopes, two 10-channel tape recorders and 40 computer assemblies.

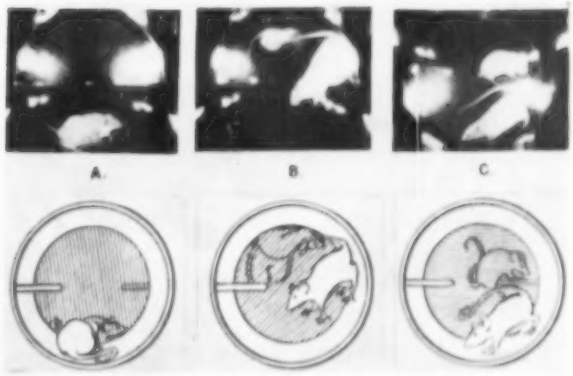
Today's simulators are just the start of a vast program to put aircraft production on a new plateau of quality. Tomorrow there well may be simulators to teach our first space pilots how to reach Mars!

Design-induced pilot errors and other accident causes are on their way out—thanks to the simulator. Flying is becoming safer because human error is being eliminated from the drafting table to the cockpit. END

Guinea pig exposed to cosmic rays at 100,000 feet seems healthy.

Aluminum container serves as cabin for animal balloon flights.

Capt. E. O. Sperry and Lt. H. Nielson parachuted from 42,500 feet.



Mice in space-flight. A. ascent, B. zero gravity, C. descent.

Space Pioneers

By LISANDE LeCOSTE

THE animal kingdom is first to cross the threshold of space. Above the southwest desert two monkeys have logged more than 80 hours in balloons at 90,000 feet. "Disgusted Gus," another monk, strapped on his space suit and rode a rocket 135 miles straight up, parachuting back safely in the nose cone. A score of mice and guinea pigs have been "out of this world."

The purpose? That men may follow. But first there is much to learn about the effects of cosmic rays and other space effects. Men have already parachuted down from 14 miles up. They are preparing even greater ventures and the animal kingdom is paving the way. That they ride in air-conditioned, pressurized comfort detracts nothing from their achievements. Cosmic rays can still turn your hair grey—and what else is unknown.

Disgusted Gus is helped out of the container after a record rocket ride. Bored expression attests that this is not his first space-hop.

Don't let anyone tell you that the stall is common only to the airplane. Beware the blade stall when flying a helicopter!

I learned about flying from that!

By ROBERT F. SULLIVAN

TIME HAS COME when helicopter experience forms a sizable segment of total aviation so I figure to contribute my two cents worth to this long-established column.

Frequently I run across the fallacy that a helicopter can not stall and it may be of service to set that matter straight before some inexperienced fellow pilot gets clobbered by believing what isn't so.

Not that I'm the last word on rotary wing experience by any means, but I have been Maintenance Test Pilot at the USAF Helicopter School for three years now and before that had my eye teeth cut in the Korean rat race. Two events I like to remember about that show—I was able to pick up top jet Ace, the late Maj. Joseph McConnell, out of the ocean when he had to ditch, and I participated in the deepest helicopter penetration of the Korean war. But to get on with my reason for writing this article.

Don't let anyone tell you that the stall is common only to the airplane and does not exist in the helicopter. The rotor blade of the latter is an airfoil as is the wing of the conventional aircraft, and is likewise subject to airflow breakdown. Conditions under which the blade will stall are different than those of the wing because you are dealing in four factors to start with—the angle of attack and the speed of both the advancing and retreating blades. However, rather than launch into a discussion of helicopter aerodynamics, let it be sufficient to say that such a situation does exist and had a definite bearing on the following experience from which I learned plenty.

When I was graduated from helicopter school, and charged off to Korea, I was sure I knew all about the helicopter. But somewhere back in my mind dwelled the idea that I had never gotten the full story on this thing called blade stalls. However, I shrugged off the idea that it would be anything more than a momentary loss of control and went on my merry way. I had the good fortune to fly with two of the best chopper pilots in the business, and they very rapidly convinced me that I was a long way from being the hottest. I settled down and started to learn this business all over again.

When I say that my confreres were among the best in helicopter operation, I mean it from the bottom of my heart. When a man can lose an engine in an H-19 at night, downwind at 300 feet and makes a 180 degree autorotation into a rice paddy with no damage to his aircraft, he can fly that thing in my book. That's a pretty tight spot when you're grossing close to 7,000 lbs.

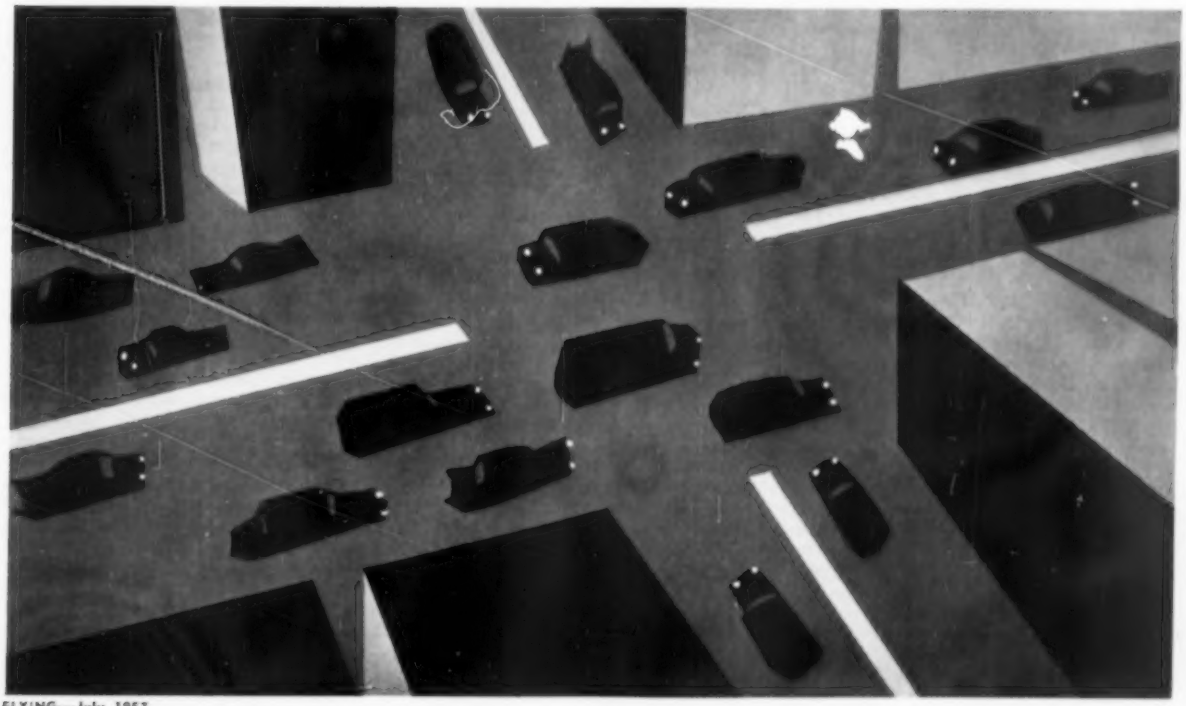
I got these old heads to tell me all the theory on the blade stall, complete with diagrams showing differences in speeds and angles of attack as the blade moved about the rotor head in flight. However, when I asked for a flight demonstration, there was ominous silence. The consensus was that anyone who would intentionally lose control of a helicopter was a low grade idiot. I filed the information in my mind for future reference. I almost filed it too deep.

About six months had passed, when one day the CO asked if we would be interested in working for a week off the battleship *New Jersey*. Needless to say, we were eager to see how the other half (*Continued on page* 70)

TINY TOWN OR MIGHTY METROPOLIS *Esso is there . . . at 600 airports from Maine to Texas!* Leave it to those Esso Aviation Dealers . . . to give your plane the knowing kind of service it needs to keep you right on schedule. With an Esso Aviation Credit Card (they're easy to apply for), you can charge almost anything—including gasoline, oil and lubrication (you can't beat those Esso Aviation products) and even tire and battery service, landing fees, overnight in-transit storage and minor emergency repairs. How's that for a good deal?

FREE TO PILOTS! For your free Esso Flight Calculator, handy guide in figuring True Course, Drift Angle and Ground Speed, be sure to see your nearest Esso Aviation Dealer.

Esso



Beechcraft H35 Bonanza

(Continued from page 35)

sea level. Our test started at the field elevation of 1,380 feet and the stop watch was set as we started our ground roll. This engine is approved for continuous running at full horsepower and we used it for this one climb, although it was obvious that Sampson wasn't too happy about it. As he explained, "The airplane climbs so good without using full power that most of us can't see any use in subjecting the engine to the extra wear and tear of full throttle operation."

I can't say that I did the best job of holding at the best rate-of-climb speed of 103 mph, but in just four minutes and 39 seconds, we were sitting 5,000 feet above the field. Most owners probably will not use the best rate of climb regularly. The nose must be held much too high for forward visibility or comfort—especially for the comfort of the rear seat passengers. A much better climb for most occasions is obtained between 125 and 130 mph. At 3,000 feet the climb was 1,000 fpm and at 5,000, it was still a strong 800 fpm. And while climbing at this good rate, you're making a pretty fair ground speed and everybody's comfortable.

While at this altitude, we tried the stall characteristics. I must confess that power-on stalls in this airplane left me a bit uneasy . . . you have to pull the nose up to an extremely high attitude before you can slow it enough to even approach a stall and then you have to hold an unseemly amount of right rudder to hold the plane straight ahead. I'd guess that, without all the rudder, the Bonanza would go into a tight left power spiral before you could stall it.

As you approach the stall, the plane really humps itself to warn you. Even without the stall warning horn, I don't see how anybody could miss the unusual amount of shudder, shaking and buffeting. In the stall I had the feeling of trying to walk a tight wire. The plane felt as if it might roll either way without warning. But it never did. And Sampson didn't seem to have much trouble holding it straight when he did a power stall. It's hard to imagine anyone ever getting into a power-on stall accidentally. But if it happens, a mere relaxing of back pressure on the elevators and the plane recovers quickly and nicely.

Power-off stalls are a different matter. With gear and flap down, the stall felt completely normal in every way. The buffeting was similar to the power-on stall, the pitch was a little more severe than you might be used to but it was straight ahead and easily controllable. Recovery was quite easy by relaxing back pressure on the elevator.

Normal flight characteristics of the Bonanza are delightful. This is definitely an aileron airplane. Aileron pressures are about as light as on any plane I've ever flown. Yet there is no feeling that they're over-sensitive. Once you're off the ground, you can put your feet flat on the floor and forget that you've got a rudder. With the light ailerons, you can roll from one steep turn into another rapidly enough to make you slightly dizzy, but it's almost impossible to induce a slip. The ball stays in the center just as though you were making fully coordinated turns. This finger-light control makes for unusually comfortable and relaxing cross-country flying.

Elevator pressures are stiffer, as they should be on a plane with such high cruising speed. If they were any lighter it would be too easy to overcontrol. Rudders, too, at cruising speed are stiff and not as effective in displacing the airplane as with conventional rudder.

If there is one real criticism of the Bonanza, it is the tendency to hunt in rough air. Actually, the movement is more of a wagging of the tail from side to side. New owners are about the only ones to complain, however. After a little flying, you stop fighting the rudder and ride along with the motion. Rough air will give you a rough ride, too. That is the penalty of high speed. But both the tail wagging and the rough ride can be reduced to a point where they're no worse than any other airplane by slowing down when rough air is encountered.

In this regard, it is interesting to note the comments made by the company in the handbook under the section titled: "Flight in Turbulent Air." It says: "The turbulent air penetration graphs given here indicate the safe and dangerous airspeeds for two gust intensities. They are much greater than will be encountered in ordinary flying; indeed, 43 foot-per-second gusts are of the magnitude found in severe thunderstorms, while 30 foot-per-second gusts will be encountered infrequently, and will give any airplane, light or heavy, an extremely rough trip. However, the same problems exist, diminished only in severity, whenever you encounter turbulence. Although you may operate up to the design cruising speed of 175 mph IAS in ordinary rough air, with a reasonable margin of safety, in any turbulence severe enough to cause discomfort to your passengers, you should slow down to approximately the design maneuvering speed of 142 mph IAS. Once you have slowed, you can increase the stability of the airplane still more by extending the landing gear. You may benefit additionally from the extended gear, since the manifold pressure necessary to maintain your speed will be increased, which will, in turn, assist in keeping engine temperatures up to normal while you are operating at low power and in the cooler air which often accompanies turbulent air. Slowing the airplane and lowering the landing gear will make your passengers more comfortable and greatly increase your margin of safety."

One thing you'll soon learn about this airplane. It is mighty hard to slow down. That's because it's so aerodynamically clean. In trying to descend to shoot some landings, I pulled the throttle back and the gear warning horn started bleating. When the throttle was pushed in enough to stop the horn, it was impossible to lose altitude as fast as I wanted without building up excessive airspeed. The answer was to slow down to 130 mph and lower the gear and flaps. With power off and the nose down enough to keep up the 130 mph, the altimeter will really unwind. The rate-of-climb instrument was pegged at 2,000 fpm down—and the needle was solid against the peg.

For landings, a traffic pattern speed of 90 mph was recommended with an over-the-fence speed of 80 mph. The only trouble I had was in getting the airplane slowed to these speeds. This, of course, is only a matter of getting used to the airplane. Otherwise, the broad-treaded tricycle gear makes landings a breeze. The chart shows a normal landing roll to be 400 feet. I came over the fence high and fast and still turned off the runway in little over 450 feet. On this basis I'd say there aren't many fields that the Bonanza couldn't get into with ease.

The H35 is an easy airplane to fly. With proper knowledge of the plane and its capabilities, no one should have any trouble. That "proper knowledge" is the touchstone of safe and enjoyable flying in the Bonanza, a clean, fast airplane in which it is easy to exceed limiting speeds. The pilot must be aware of these factors and conscious of his speed; he must be farther ahead of his airplane at all times, must anticipate and act sooner than in slower types.

With these simple facts in mind, the Bonanza can give you a world of safety and many hours of pleasant, luxurious, highspeed cross country travel.

Very few visual changes have been made in the 1957 Bonanza. Use of the new Continental 0-470-G engine rated at 240 hp with its greater weight necessitated a redesign and beefing up of the compartment structure and engine mounts. Higher compression, sharper firing and more vibration is well dampened with dyna-focal engine mounts—big rubber biscuits that do a good job of absorbing vibration.

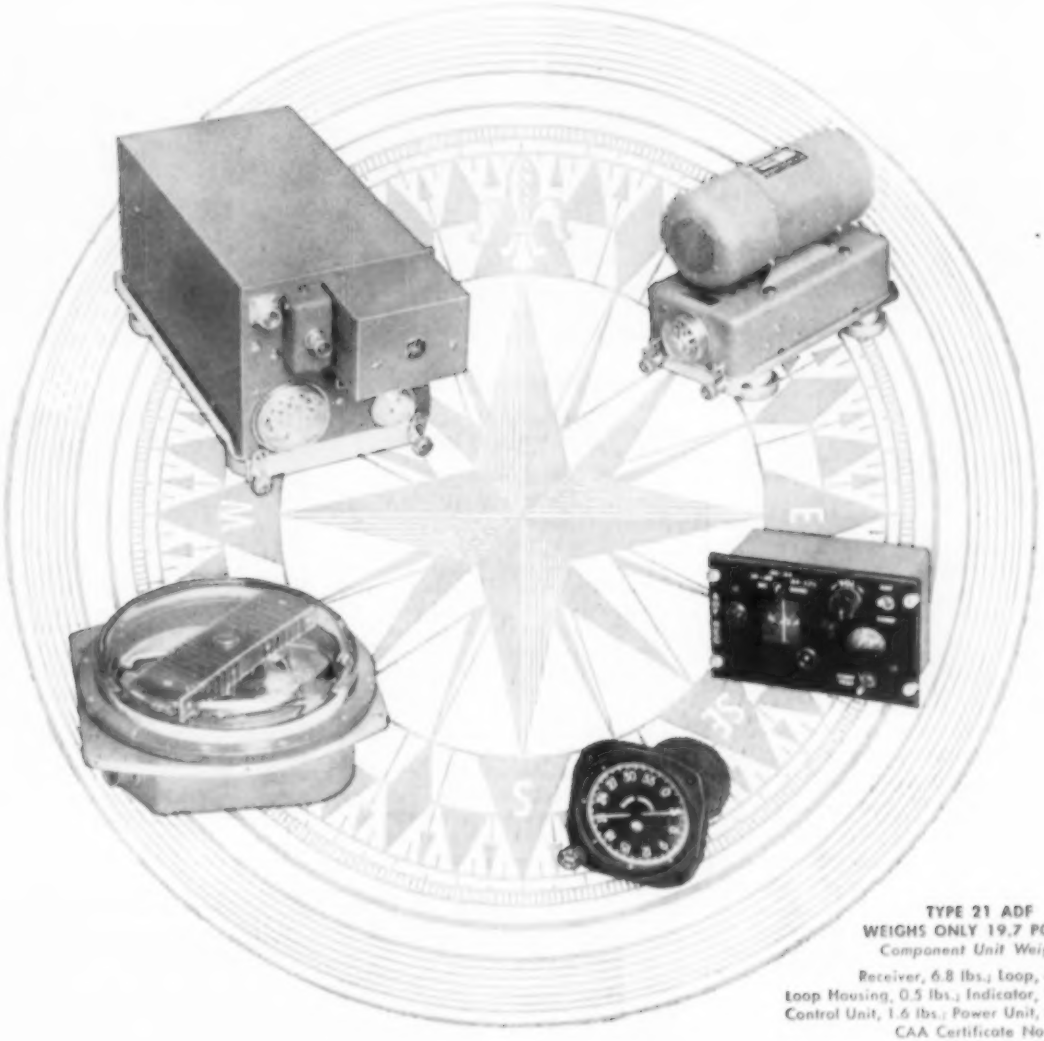
While retaining the same wing, the interior structure has been redesigned for greater strength. A new and beefier carry-through truss is being used in the 1957 model, along with heavier fittings. As the plane grew heavier through the years, its large excess safety factor over CAA requirements became less. This has now been brought back up to 8 G's in the '57 model as compared to 5.7 required by CAA.

In order to meet CAA specifications for

(Continued on page 62)

THE AIRMAN'S WORLD

So many requests were received by FLYING for reprints of the popular series, "The Airman's World," that we are happy to announce it will be published in book form by Random House. Containing many of the most popular "Airman's World" features in addition to new photographs and text, it will be an 8½ x 11 hard-bound book retailing for $2.95. Publication date is August 1, but anyone desiring a first edition copy may send his order now with check or money order to: Random House, Inc., Room 410, 457 Madison Ave., New York 22, N. Y.



TYPE 21 ADF
WEIGHS ONLY 19.7 POUNDS
Component Unit Weights:
Receiver, 6.8 lbs.; Loop, 4.3 lbs.,
Loop Housing, 0.5 lbs.; Indicator, 1.3 lbs.;
Control Unit, 1.6 lbs.; Power Unit, 5.2 lbs.;
CAA Certificate No. 1R 4-9

NEW LOOK in navigation aids

The Time Tested ADF Now In Less Weight, Less Space

The ADF is a basic air navigation instrument, used in all parts of the world, tunable to some 60,000 transmitters. But the important thing now about the ADF is that ARC has engineered an ADF system down to less than 20 pounds in weight, with a comparable saving in space.

Now pilots enjoy the advantages of dual installations of this compact miniaturized equipment in tolerable weight and space requirements.

The ARC Type 21 ADF is built to today's more critical speed and environmental demands. It has hermetic sealing of vital components, such as the entire loop assembly. It covers all frequencies from 190 kc to 1750 kc . . . operates on only 2.8 amps at 27.5 volts dc input. A significant feature is the extremely low loop drag – only two inches below the aircraft skin.

Ask your dealer for detailed literature.

Dependable Airborne Electronic Equipment Since 1928

Aircraft Radio Corporation BOONTON, NEW JERSEY

Miniaturized Automatic Direction Finders
Omni/Loc. Receivers • Course Directors • UHF and VHF Receivers and Transmitters • LF Receivers
and Loop Direction Finders • 10-Channel Isolation Amplifiers • 8-Watt Audio Amplifiers • Interphone Amplifiers
Omnirange Signal Generators and Standard Course Checkers • 900-2100 Mc Signal Generators

ARC

UNITED IS HIRING 228 FLIGHT OFFICERS

New aircraft scheduled for delivery in 1957-1958 requires immediate expansion of United's Flight Officer personnel. United is interviewing applicants now for training classes extending to February 1958.

You receive frequent, regular pay increases as a United Air Lines Flight Officer. You're paid while training at United's comprehensive Flight Training Center at Denver, Colorado. When you go on line duty you receive $485 a month—$515 at the end of your first six months. As you advance, so do your earnings. United also offers a generous insurance program, retirement income plan, many other benefits.

To qualify you need only a commercial pilot's license with 300 hours or more (no multi-engine time required); you must be a U. S. citizen, 21-28, between 5'7" and 6'4" in height, a high school graduate, and able to pass a flight physical without waivers.

Write today for booklet outlining your opportunity for a high-paying career with United Air Lines.

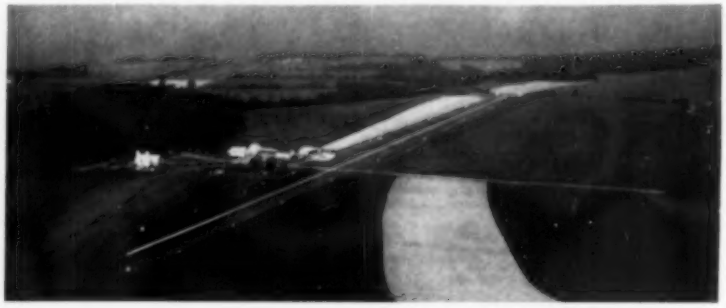
C. M. Urbach, Supt. of Placement
UNITED AIR LINES, INC.
Operating Base, Dept. FLY-7
Stapleton Airfield, Denver 5, Colo.

Please send me at once your booklet outlining my career opportunities as a United Air Lines Flight Officer.

Name _____

Street _____

City _____ Zone _____ State _____



OVERNIGHT STOP—NO. 27

GREAT OAK LODGE and YACHT CLUB

Chestertown, Md.

FRONTING ON CHESAPEAKE BAY and Fairlee Creek, 11 miles northwest of historic (1706) Chestertown on Maryland's Eastern Shore, and about 20 miles due East of Baltimore, Great Oak Lodge and Yacht Club, once private, now welcomes outside visitors to true Southern estate living in club-like atmosphere.

Located on the 1,500-acre Frank C. Russell estate, the Lodge offers 70 air-conditioned rooms, three dining rooms and recreation facilities including fishing, horseback riding, skeet and trap shooting, yachting, swimming (in outdoor heated pool, or Bay) and wild duck and Canadian goose shooting, par excellence. Rates are $10-$16 per day single; $17.50-$26 double, on European Plan or, American Plan, $20 per day per person. Reservations necessary.

Russell Airport (Washington, D. C. chart) is a single 3300' North-South fairway-mowed sod strip, with clear approaches. Unicom and 80-91 oct. gas available. Seaplanes may land on Fairlee Creek at Lodge and Club tender will meet.

(Continued from page 60)

handling the increased gross weight, the area of the trim tab has been increased. Long-time Bonanza pilots might notice a slightly increased sensitivity. Otherwise it operates and feels pretty much like past models.

The oil radiator on the new engine has been moved forward to the nose. This has helped give much more room for accessories at the rear of the engine—especially interesting to mechanics who will find knuckle space to work. I'm told that even the magnetoes can be worked on without removing.

Circuit breakers which previously had been installed wherever there was room, have now been consolidated in the same area. There are still a number in the small, door-covered panel at the lower right of the main instrument panel. All others are located just underneath.

For the first time, the Bonanza is coming off the production line with an all-metal, hydraulically operated propeller. While new to this airplane, it is well tested in service having been used on the Mentor, an Air Force training model, for the past few years. No particular difference could be discerned in flight, but it operated much more rapidly, showed no tendency to over-rev as the old electric prop sometimes did and was more positive in arriving at the desired rpm set-

ting. The control is a standard push-pull with a vernier for fine adjustment instead of the knob that formerly operated the electric prop.

In older models the fuel selector valve and wobble pump were a single integral part. In the '57 they have been separated. Although I never heard any complaints about the old arrangement, I like the new set-up better.

Up until this year, the front seat has been of the bench type and not adjustable. The front seats now have been separated and are individually adjustable. A retractable arm rest between seats can be pushed down flush with the seats for getting in and out of the pilot's seat. There's also a center arm rest in the rear seat that folds into the back and there's a barber chair attachment that fits on top of the seat backs to cradle the neck and head in a most comfortable way. The backs of the front seats also recline and a roll has been built into both front and back seats to support the small of the back—that area which usually tires quickest from long sitting. All in all, this comfort is a real invitation to long range flying.

Another example of the plush touch is the baggage compartment. Completely lined and carpeted, it is a roomy area approved for 270 pounds and is accessible both through the 24 by 22 inch outside door and from inside the cabin. A coat hanger, secured overhead behind the rear seat, may be used to hang clothing in the baggage compartment. END

Specifications and Performance

BEECHCRAFT H35 BONANZA

Type: Four-place, all-metal low-wing
Engine: Continental, 6 cylinder, 0-470-G, rated at 240 hp @ 2600 rpm
Max. Cruising Speed:
a) at 75 per cent power 196 mph at 5,000 ft.
b) at 65 per cent power 190 mph at 8,000 ft.
High Speed at Sea Level: 206 mph
Rate of Climb at Sea Level: 1,250 ft. per min.
Service Ceiling: 19,800 ft.
Stalling Speed (landing) with flaps: 57 mph
Maximum Range @ 160 mph, 10,000 ft.: 800 miles on 39 gal. 1,170 miles on 57 gal.
Take-off Run (20° flaps) sl, 10 mph wind: 670 ft.
Landing Run (30° flaps) sl, 10 mph wind: 400 ft.
Fuel Economy, at max. range 20.5 miles per U.S. gal.
Baggage: Max. 270 lbs.
Fuel Capacity: Standard tanks: 39 gal. Aux. wing tanks: 57 gal.
Gross weight 2,900 lbs.
Empty weight 1,833 lbs.
Useful load 1,067 lbs.
Wing area 177.6 sq. ft.

NOW $90 Buys the Basic Oxygen Unit for Your Aircraft

Use this New Puritan Oxygen Unit

- ***As a Portable Unit***
- ***As a Permanent Installation in Your Airplane — Designed to Your Specifications***

Now, you can buy the type of assembly that is best suited to your specific needs. This basic unit, which costs $90, less cylinder, consists of the following: one adjustable two-stage flow regulator; cylinder connection for attachment to aircraft oxygen cylinder (1800 lbs. pressure); two outlet valves; two pieces of plastic tubing; one dozen Puritan disposable plastic masks.

You may quickly and easily adapt this basic equipment to meet your own individual requirements. (Add more outlets and plug-ins for the capacity you desire.) You use only safer, low pressures since regulator attaches to cylinder, and pressure is reduced from here on. Oxygen is supplied from cylinders, in the size you need, available at your aircraft distributor—or use lower cost medical cylinders available from Puritan.

THIS PURITAN EQUIPMENT NOW IN USE ON THE WORLD'S FINEST AIRLINES

After years of use aboard many major domestic, international and foreign air carriers, Puritan airborne oxygen equipment has been judged "tops." The Puritan disposable mask—the same one developed to meet rigid hospital standards—is now available to the aviation field for the first time.

Aviation Division PURITAN MAID

WRITE TODAY FOR COMPLETE DETAILS ON HOW TO ORDER YOUR PURITAN AIRBORNE OXYGEN EQUIPMENT

Puritan SINCE 1913 COMPRESSED GAS CORPORATION 2012 GRAND AVENUE, KANSAS CITY 8, MO.

PIONEER MANUFACTURER OF AVIATION OXYGEN BREATHING EQUIPMENT

CLASSIC BOOK *by WEEMS & ZWENG*

"INSTRUMENT FLYING"

Again available . . . completely revised

This authoritative 298-page book is written especially for instrument rated pilots, and instrument rating applicants. Has helped thousands of pilots obtain their CAA instrument ratings. For years the best and most popular book in its field . . . now completely revised and brought up-to-date in this 6th edition. Covers all aspects of instrument flying including instruments themselves, radio facilities, dead reckoning, automatic direction finding, meteorology, air traffic control, civil air regulations. Many other important subjects. Written clearly, easy to understand. Only $6.00. Address Dept. 9. Weems System of Navigation, Annapolis, Maryland, or see your nearest aviation dealer.

what's an Instrument Rating worth to you?

for only $5 . . . the best guide anywhere!

Zweng's 'Radio and Instrument Flying,' with new typical cross-country written examination!

☐ *Radio and Instrument Flying ($5.00)

Other timely Zweng Manuals, each averaging more than 300 pages:

*Indicates new revised 1956 or 1957 edition.

☐ *Aircraft and Engine Mechanics ($5.00)
☐ *Flight Engineer ($5.00)
☐ *Airline Transport Pilot Rating ($5.50)
☐ *Private & Commercial Pilots ($4.00)
☐ Flight Instructor ($5.00)
☐ Ground Instructor Rating ($4.00)
☐ Helicopter Pilot Ratings ($5.00)
☐ *Flying the Omnirange ($4.00)
☐ Control Tower and Dispatcher ($5.00)
☐ Manual of the E-6B Computer ($3.00)
☐ *Rules of the Air ($2.00)
☐ Meteorology for Airmen ($3.00)
☐ *Safety After Solo ($4.75)

Check the manuals you want, fill in the blanks below, then clip this ad and send it to:

PAN AMERICAN NAVIGATION SERVICE
12021 Ventura Blvd., F-7
North Hollywood, Calif.

☐ Payment enclosed ☐ Send C.O.D.
☐ Send me a free copy of your new 1957 catalogue.

Name _____

Street _____

City & State _____

VISUAL TRAINING
OF CANDIDATES FOR
PILOT RATING
To Meet Eyesight Requirements of C.A.A. or Air Force Exams
DR. JOHN T. FLYNN
OPTOMETRIST - ORTHOPTIST
Visual Training Specialist
300 W. 23rd St., New York City

OXYGEN EQUIPMENT
SALES & SERVICE
REGULATORS—MASKS—VALVES
PORTABLES & CYLINDERS
FIXED INSTALLATIONS
GOV'T. APPROVED REPAIR STATION
ZEP AERO Phone: ORegon 8-1161 EL SEGUNDO, CALIFORNIA

150 Years of Maps

(Continued from page 27)

were ordered to duty with Navy, and the officer personnel was split between Army and Navy. In 1945, C&GS was the first U. S. agency to adopt Shoran and in 1947 the Survey combined Shoran and Loran in an Electronic Position Indicator. In 1952, C&GS made a notable "save" by warning the Hawaiian area that a tidal wave was due from a submarine earthquake near Kamchatka Peninsula. During 1953-54 both the Alaska Coast and Gulf Intercoastal waterway surveys were completed.

Currently manning 17 ships, C&GS has charted more than 100,000 miles of coastline, and criss-crossed our geographic land area of some three million square miles with markers fixing points of longitude, latitude and elevation at an average of about 7½ miles apart over 30 per cent of the country. The remaining 70 per cent is in process of like detailed marking.

The aeronautical charting program began in 1926, with "strip" maps familiar to veteran pilots. These were followed by 87 "sectional" maps covering the nation. Originally such maps were designed for low altitude, visual flight. Then came such things as Radio Facilities charts, Instrument Approach and Landing charts, Aircraft Position charts, etc. Millions of each are printed annually and kept current with the manifold changes constantly taking place.

To list all the modern equipment employed by C&GS would require a catalogue. The aerial photography section of the bureau has the only nine lens camera in the world. And this gadget is matched by sea wave detectors, magnetic variometers, cartographic computers, galvanometric seismographs and other unpronounceable aids without number.

The sum and substance of the matter is that the Coast and Geodetic Survey is a component of government whose work is endless and without ceiling in the national story. It has a heroic and useful past and a challenging future. Its contributions to each of us personally and to the structure of the nation are matters taken for granted. But it is good on this 150th anniversary of this great service to pay whatever tribute is possible and long overdue. FLYING joins any and all who cry "well done" to a service that has been so fundamental in evolution of the air age, to say nothing of historic service on land and sea. END

The Old

The New

NEW FORMAT FOR SECTIONAL CHARTS

WITHIN the coming year most of the Coast and Geodetic Survey's Sectional Aeronautic Charts now in use will be superseded by charts in an entirely new format.

Basically the new charts have been very much simplified by removal of minute detail such as certain spur railroads, secondary roads, short tributary streams. Clarity is enhanced by removal of blue control area tint and the low-medium frequency airway limits, with center lines of VOR airways indicated by a blue line and L/MF airways by a narrow band of magenta tint.

To improve readability, contours are shown in gray at intervals of 1,000 feet instead of 500, and projection lines are only on the full degrees and half degrees of latitude and longitude—the intermediate 15-minute lines having been omitted. Several names of smaller towns in highly populated areas also have been removed to avoid congestion.

All airports having permanent type hard-surfaced runways are shown by runway patterns. A number of distinctive landmarks have been added, especially outdoor theaters which have a new symbol. Prominent obstructions have a bolder symbol, with elevations in larger type.

The length of range courses and the size of other radio facility symbols have been reduced and, in most cases where L/MF and VOR ranges have the same identification, they have been combined in a single box to eliminate unnecessary overprinting.

SEEMS A LOT OF US still don't have this communications channel business straight. It's not surprising, since I've been getting different stories from several different "experts." (If these guys didn't *say* they were experts I'd suspect they didn't know for sure what was going on.)

LEARNED A FEW THINGS, tho'. Let's whip up a "fer instance." Take the tower over at Reading, nestled in the Pennsylvania hills and almost entirely surrounded by Dutchmen. You wouldn't call it a congested area—except when Reading Aviation throws its annual Fair (which comes June 1 this year.) The very fine control tower does business on 119.1 mc.

IF YOU TUNE READING tower quite a while before you're in close, you find the frequency real crowded. Check the Airman's Guide and, sure enough—Washington National, 120 miles southwest, is also on 119.1. But don't quit yet—wasn't that a KLM Connie calling? Yep—book shows same frequency at Idlewild International Air Patch, 115 miles east of Reading. No wonder the channel is crowded!

WHY DON'T THEY use different frequencies? Let's check. In the area between Washington and Providence, and from about Harrisburg and Binghamton to the coast, there are 27 control towers, using 12 "ordinary" VHF frequencies (118.1, 118.3 . . . 121.3) exactly 35 times. Most of these 12 frequencies are used 3 times.

ACTUALLY, it's not the cross-talk between towers themselves that clutters the channel, but that between *aircraft talking* to the two different towers.

THE WHOLE SET-UP is getting *more* crowded all the time, so what to do? Well, for one thing, they're trying to put the more exotic communications (radar control, much of the direct Center communications) on channels between 125.7 and 126.7 mc where they won't interfere with primary tower frequencies. For another thing, they're starting to use frequencies *between* those we're used to—even-tenth megacycles like 120.4 and 120.6 for *other* than primary tower communications.

LOTS OF FINE PILOTS have never landed at Chicago Midway or Washington National, but the ones I've talked to want to be able to do it real smooth *if* and *when*. That means more channels—better figure on having them.

See y'all next month,

Nancy

NARCO • Fort Washington, Pa.

narco Sapphire 1016

90 or 360 CHANNEL TRANSMITTER
90 or 560 CHANNEL RECEIVER

When you see an aircraft with the Narco Sapphire 1016 antenna you know it's equipped with the ultimate in fine communications. Designed for reliable VHF communications on every frequency provided for present and future civil aircraft communications, the 1016 has a VHF transmitter capacity of 90 or 360 channels and crystal-controlled receiver of 560 channel capacity. Precise 50 kc separation is provided through the entire range from 108 to 135.95 mc.

The Sapphire 1016 is CAA-certificated for airline use and matches the quality, performance and dependability of the finest airline-type equipment. Yet its price compares with limited channel equipment normally used in executive aircraft.

1016 unit occupies ½ ATR rack; total weight 28¾ lbs.

NOW! PRECISION VOR/ILS CONVERTER FOR THE 1016

Now you can add VOR/ILS localizer function to the Sapphire 1016 with the Narco VOA-3 converter-indicator. Adaptable also to the Narco Simplexer. Fits any standard instrument cut-out; total weight, including remotely-installed converter unit, 4 pounds. Extreme accuracy and reliability. Only the Sapphire 1016 permits addition of VOR to crystal-controlled communications equipment.

See your Narco dealer or write for brochure

narco

NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PA.

FLYING...DRIVING...BOATING

LUBRI-LOY

Makes it trouble-free...safer...surer

Guaranteed To Keep Your Engine In Tune

Trouble-free . . . safer . . . sure performance from any engine is as easy as adding one quart of Lubri-Loy . . . the concentrated Tune-Up oil . . . to your crankcase. Lubri-Loy keeps your engine in tune . . . operating at peak efficiency . . . makes it last longer too. All proven in recent test supervised by official U.S. Government agency. Get all the performance from your engine . . . add Lubri-Loy today . . . it delivers results promised by others. Sold wherever engines are serviced.

CAA APPROVED*

U. S. DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON, 25

* "We consider it acceptable to use Lubri-Loy in the engines of light aircraft in the ratio of one part Lubri-Loy to a mixture of eight parts of regular non-detergent aviation engine oil."

Write for details on how Lubri-Loy obtained U. S. Government Agency approval in grueling 200 hour, 3 year performance test.

THE LUBRI-LOY CO. • St. Louis 10, Mo.

AIRCRAFT INDUSTRY
NEEDS SPECIALISTS!

YOU can develop skill and know-how . . . specialize in aircraft maintenance, aircraft design, stress analysis!

Aeronautical University has had more than 25 years' experience in training personnel for the aircraft industry. Graduates in demand. Study AERONAUTICAL ENGINEERING TECHNOLOGY • ENGINEERING • DRAFTING • AIRPLANE AND ENGINE MECHANICS. Get your C.A.A. license, in a few months, degree in 24 months. Outstanding faculty and equipment. G.I. approved. Part-time employment available. Free placement service. Founded by Curtiss-Wright. Write for information and "Opportunities in Aviation."

AERONAUTICAL UNIVERSITY
AT CHICAGO MIDWAY AIRPORT
6126 West 63rd Street, Chicago 38, Illinois

35 R.P.M. STALL

This exceptional Miles Gemini Twin for sale. C. of A. July 1957. Total time, frame and engines 350 hrs. 36' wing span. 4 passenger—disposable load 1070 lbs. Cruise 130, stall 35, landing speed 40. Take-off 600'. Electric retractable undercarriage. Brand new Lear LTR6A and Omni. 66 gals. gas, range 1015 miles. Brand new Plessey screened cables and Dunlop tires. Spare tires and batteries. Unsurpassed for short field landings, terrific visibility, very stable and easy flying; wing slots, gas consumption 5½ gallons per engine per hour. Cost $25,000.00, sell for $15,000.00. Need 8-passenger seating—will accept one or two Tripacers in exchange. **John Pitt, 5157 Sherbrooke Street West, Montreal.**

Avoid That Mid-Air Collision

(Continued from page 49)

alter and go to the left instead of the right, your best bet is to turn left. A slight dive at the same time will move you out of the way faster.

If you fly frequently into large terminal areas with controlled airports, I can think of no better investment in safety than a radio which permits you to operate Simplex (i.e., transmit and receive on the same frequency). This permits you to monitor other aircraft in the area and mentally keep track of them. For example, I recently called El Paso tower when over Harrington Ranch fan marker about 20 miles west of the airport. A minute later I heard an airliner report over Harrington fan marker also destined for El Paso. His announced altitude was 1,000 feet higher than mine. I immediately called on the tower frequency, and knowing the airline captain would hear me, reminded the tower that I was only one minute from the Harrington fan marker and at an altitude slightly lower than the airliner. I expressed concern that he would let down on top of me. At this point the captain broke in, told the tower that he had heard my transmission, would make sure he had me in sight before letting down; and thanked me for keeping him advised. While en route on airways a similar advantage can be realized by monitoring the 126.7 Insac Simplex frequency.

It is realized that this calls for an additional VHF receiver besides the one you use for common navigation, but again I think the investment in the Simplexer or equivalent device is well justified. It is amazing how much air traffic you will hear in your immediate vicinity even though operating in CAVU weather. The advantages here are very much the same as outlined in the previous instance. If you hear another aircraft flying at your altitude and on the same airway report over a navigation facility, it makes good sense to request Insac to advise the other aircraft of your position. By operating Simplex on 126.7 you can be fairly assured that the other aircraft will hear you directly, although you are not legally permitted to use this frequency for air-to-air communications. Usually in a situation like this the other aircraft will acknowledge to Insac that he has heard you and either request further information as to your speed and relative altitude over a given point, or state that he will be alert.

Night flying poses all of the requirements of day flying plus a few more. Light aircraft, with their small wing-tip and tail-lights, can be very difficult to see, particularly against a background of city lights. If you do very much night flying, an investment in one of the rotating anti-collision lights is well worthwhile, since they greatly improve the visibility of your aircraft. Remember, however, if you install such a light, turn it off before entering cloud or heavy precipitation under IFR conditions since the rotating light reflection on the clouds can quickly cause severe vertigo. END

NEW VHF TRANSMITTER-RECEIVER
2-WAY RADIO

for the private pilot

AIR-O-EAR® (Registered in U.S., Canada and 19 major countries) **TRANSMITTER-RECEIVER TR-102**

10 Channel VHF Transmitter • Tunable VHF Receiver
Built-in Power Supply • Built-in Modulator
Size: 5½" x 3½" x 8", Weight: 8 lbs.
SPECIFY 6 OR 12 VOLT

ORDER NOW WHILE LOW INTRODUCTORY PRICE IS IN EFFECT

$150.00 COMES COMPLETE READY TO OPERATE with antenna, two high power crystals (122.5 and 121.5). Extra crystals, factory installed and adjusted $10.00 each.

FOR HEADSET OPERATION ONLY, but can be connected to existing radio for cabin speaker operation. (Additional headset jacks can be located anywhere.)

PROVISION FOR OMNI
Front panel OMNI plug-in is to furnish signal to our Air-O-Ear OMNI planned for future production – price around $100.00.

Precision instrument, conforms to newest CAA High Density Zone requirements. Range with ignition shielding: 50 to 150 miles. Range without shielding: 50 to 150 miles on transmitter, 30 to 60 miles on receiver.

- Ignition suppressor permits operation with unshielded ignitions (Saves up to $100 on installation costs)
- Noise squelch control • Two headset jacks
- Front panel plug-in for OMNI
- Front panel modulation indicator for transmitter
- Sensitive VHF receiver tunes from 108 to 128 mc
- Powerful 10 channel VHF transmitter
- Transmitter power is 2 to 2½ watts – same as $500 sets
- Transmitter uses super modulation and speech clipping techniques as developed for commercial aircraft

LOW FREQUENCY WEATHER RECEIVER

A new home receiver designed to provide up-to-the-minute weather reports as well as standard broadcasts to the flying enthusiast. It tunes from 200 to 400 Kc, and operates satisfactorily even in areas where VHF is blocked out. Invaluable in planning flights, and instructive for the student.

receives standard broadcast band and low freq.

- Listen to the half-hour weather reports
- Tune-in the new automatic tape machines which transmit weather reports continuously
- Hear CAA Radio give information and assistance to planes in flight
- Hear Control Tower transmission
- Receives standard broadcast band

Plugs in any wall socket. Features built-in antenna, 5" speaker and headset jack. Comes complete ready to operate.

Model B **$49.50**

Model C (deluxe unit with tone filter)
$69.95

HOME VHF RECEIVER

HEAR PLANES IN FLIGHT, CONTROL TOWERS, WEATHER and EMERGENCY BROADCASTS

PLUGS INTO ANY WALL SOCKET
200 MILE RECEPTION
WITH BUILT-IN ANTENNA

SOLD THROUGHOUT THE WORLD DIRECT FROM MANUFACTURER

AIR-O-EAR®

30-DAY BILLING
with Purchase Order or Company letterhead. C.O.D.'s accepted with no deposit required. 10-day return privilege if desired.

$79.95

AIR-O-EAR IS WORLD'S LARGEST
Thousands of Air-O-Ears are used THROUGHOUT THE WORLD to outnumber all others combined. Some of our leading purchasers are:

AMERICAN AIRLINES
NORTHEAST AIRLINES
TRANSOCEAN AIRLINES
STANDARD OIL COMPANY
BELL AIRCRAFT
ALAMO AIRWAYS
CHAMPION SPARK PLUG CO.
NORTHERN CONSOLIDATED AIRLINES
U. S. PLYWOOD CORP.
FLYING TIGER AIRLINES

BUILT-IN ANTENNA—PLUGS INTO ANY WALL SOCKET. Operates anywhere . . . no installation required.
HEADSET JACK on control panel: includes automatic speaker cut-out.
AUXILIARY SPEAKER JACK for plug-in of remote speaker load.
OPERATES IN AUTO OR PLANE WITH D.C. POWER KIT (extra). Exclusive design allows Air-O-Ear to operate in auto or plane. Shielded ignition system **not required.** Just unplug for home use.
NOISE-SQUELCH CONTROL adjustable; completely eliminates static and interference. Dead silence is maintained except during actual broadcasts.
24-HOUR CRYSTAL-LIKE STABILITY. Highest stability and sensitivity produced by exclusive coaxial tuning.
STRONG SUPERHETERODYNE CIRCUIT. RF stage, oscillator, mixer, 2 IF amplifiers, audio amplifier, noise limiting detector, power amplifier, Noise-Squelch DC amplifier, Diode Clipper, 2 separate selenium rectifier power supplies, 3 stage Automatic Volume Control, 6 inch heavy duty oval speaker.
PLUGS INTO ANY WALL SOCKET — 115 v. AC, 35 watts **(export shipments** furnished with 220 v. 50 or 60 cycles on request), compact ebony case, black crackle control panel with white dial calibrations, 7½" x 5" x 4½", weight: 5 lbs., shipped hermetically sealed in plastic with shock-proof carton.

ADAPTS TO AUTO OR PLANE WITH D.C. CONVERTER KIT
Model 710-WN (108 to 130 mc — General Aviation) $79.95
Model 710-YN (118 to 140 mc — Industrial) $79.95

SOLD THROUGHOUT THE WORLD:
PARIS — Cie. Francaise d' Expansion Commerciale
LONDON — F.U. (London) Ltd., Albermarle St.
BERLIN — Walter Strunck, Berlin S.W. 68
ROTTERDAM — Unavis, Groothandelsgebouw
BUENOS AIRES — La Parafinadora, Argentina
SANTIAGO — Aberto Gonyalez Vidal & Co., Ltda.
SAO PAULO — Jose Urangs, Rua Paula Souza 1/25
BOLIVIA — Teodoro Pepper, P.O. Box 571, La Paz
EXPORT AGENT — Albert D. Denis & Co., 354 S. Spring St., Los Angeles 13, California

AIR-O-EAR D.C. CONVERTER KIT

Converts VHF Receiver Model 710-WN to 6 or 12 volt operation. VHF reception in Auto or plane. Shielded ignition not required. Weight: 4 lbs.; 5" x 4" x 3"; includes Whip Antenna, cable, Noise Filter.

$47.50

NOVA-TECH, INC.

1721 Sepulveda Blvd.
Manhattan Beach 12, Calif.
Cable Address: NOTEC

NOVA-TECH, INC., 1721 Sepulveda Blvd., Manhattan Beach 12, Calif.

GENTLEMEN: Please ship the following items with 10-day return privileges. Also send free copy of the "Flight Instruction Manual." Send for literature.

QUANTITY ITEM (Specify frequency of extra crystals.) PRICE

☐ Enclosed is payment in full of $..... ☐ Please send C.O.D. (No deposit required.)

Name

Address

City and State

INQUIRE ABOUT ATTRACTIVE DISTRIBUTORSHIPS IN YOUR AREA

the Beechcraft B

THE AIRPLANE WITH BUILT-IN EXTRAS

The Beechcraft Bonanza's years-ahead design enables you to travel **first class** the **least expensive** way. Just look at the built-in extras that are yours in the new, four-place Beechcraft Bonanza for 1957:

GOES FASTEST Speeds up to 206 mph, with a cruising speed at least 30 mph faster than its nearest competitor! **GOES FARTHEST** In the Bonanza, you fly up to 1170 miles non-stop! **QUIETEST** The Bonanza is the quietest airplane in the skies—just like riding in a modern automobile! **MOST VISIBILITY** The largest windows in the sky and modern, low-wing design give maximum safety and enjoyment to pilot and passengers! **MOST USEABLE** Only the Bonanza can carry so much passenger and baggage weight! **EASIEST TO FLY** No airplane is easier to fly than the Bonanza—and no other airplane offers such dependable, rugged construction!

Why wait until tomorrow?—the pride, prestige, and unsurpassed efficiency of Beechcraft Bonanza ownership can be yours today. See your Beechcraft distributor or dealer for a demonstration.

see most!

go farther!

carry more!

Bonanza does **most** for you

This is the way to travel in a comfortable hurry—above the jam of earth-bound traffic. This is the way to enjoy a fuller life, to meet the demands of crowded business days, and still have the time you want and need for family and friends.

This is **modern** travel by Beechcraft Bonanza! From the moment you step through its wide limousine door until your flight is completed, you'll thoroughly enjoy all the elegance and comfort which set the Bonanza uniquely apart from the commonplace. And, best of all, you **can** afford Beechcraft Bonanza supremacy. New leasing and financing plans make Bonanza ownership possible at a cost far less than you may think. Treat yourself to a ride in the finest—your Beechcraft distributor or dealer will provide the Bonanza.

the **finest**

single-engine airplane

ever built!

Beechcraft

Beech Aircraft Corporation Wichita, Kansas

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Check-fly this new, faster Gull on your operation. Discover the quiet comfort, convenience, greater payload, and safety this husky-hulled "Fly anywhere...Land anywhere" amphibian has to offer. Write for more information on "the 200-MILE-AN-HOUR" amphibian.

Trecker AIRCRAFT CORPORATION
A Subsidiary of Kearney & Trecker Corporation
6785 WEST NATIONAL AVE. • MILWAUKEE 14, WIS.

CALL YOUR GULL DISTRIBUTOR

CORPUS CHRISTI, TEXAS
Gulf Aircraft Sales
Phone: AT 8237

DETROIT, MICHIGAN
Marine Aircraft, Inc.
Phone: Twin Brook 1-9038

ATLANTIC COAST STATES
Hubert A. H. Cook Associated
Phone: New York, Plaza 3-1170

LONG BEACH, CALIFORNIA
Aircraft Sales & Brokerage Co.
Phone: GArfield 7-5405

MILWAUKEE, WISCONSIN
Royal Aircraft Sales, Inc.
Phone: SUnset 2-8810

EXPORT OFFICE
900 North Avenue
Plainfield, New Jersey

MONTREAL, QUEBEC, CANADA
Timmins Aviation Limited
Phone: MElrose 1-8533

OSHAWA, ONTARIO, CANADA
Field Aviation Company
Phone: RA 3-2204

SAN FRANCISCO, CALIFORNIA
Commodore Air Service
Phone: Sausalito 100

ENGINEERING DEGREE IN 27 MONTHS

B.S. Degree: Aero., Chem., Civil, Elec., Mech. & Electronic Eng. inc. Radio, TV; 36 mo. B.S. degree in Math., Chem., Physics. Prep courses. Demand for grads. Spacious campus. 20 bldgs; dorms, auditorium, gym. Low rate. Earn board. G.I. Appr. Enter Sept., Dec., March, June. Catalog. 1377 E. Washington Blvd., Fort Wayne 2, Indiana.

Keeping pace with progress

INDIANA TECHNICAL COLLEGE

EXECUTIVE - PILOTS - PRIVATE
SNACK BAR - UNICOM - LIGHTS
ROTATING BEACON
50 MI. S. WASHINGTON, D.C.
SHANNON AIRPORT
FREDERICKSBURG, VA.
HERTZ RENT-A-CAR LICENSEE
Ph.: Essex 3-4431 80-91-100 Octane

SKYCRAFT DESIGN

Specializing in custom-quality CAA—approved metal conversions. Langhorne, Penna.

I Learned About Flying from That!

(Continued from page 58)

lived and jumped at the chance. We soon hopped over to the east coast of Korea and got on the job. The week sped by and we left the *New Jersey* to return to the west coast. It was a reluctant parting. We had been treated wonderfully and had enjoyed our tour with the fleet. After accommodations on the battleship, our field tent wasn't going to look like much. We took off from the ship, refueled at K-18 on the east coast and started across the mountains. Right then I got a first-hand introduction to a blade stall.

We were climbing west into the range that runs north and south along the coast. Purposely we stayed well south of Sorak-San, a 5,602 foot rock noted for weird air currents. The wind at K-18 was a nice steady 10 to 15 knots. Their upper air charts showed little change at any of the altitudes we would be using. The day was beautiful. We crossed the first foothills about noon.

Some 35 minutes out of K-18 it became painfully obvious that all was not going as it should. Climbing toward the first saddleback, strange things began to happen. The helicopter stopped climbing and started to descend. Full power—2,400 rpm and 45 knots—was giving us a 2,000 ft/min. rate of descent. Usually a power setting like that will pile on altitude, but we were going down like an elevator. We were getting plenty shook. Not only were we not going to clear the ridge, but stood a good chance of never reaching it. This called for a soul-searching consultation and the decision that a strategic withdrawal was in order. To put it bluntly, we wanted to get out of there while the getting was good.

We made a 180 and started out, searching the ridges for possible updrafts that would stop our rate of descent. The spilling of air over the top of the mountain created extreme turbulence and control wasn't the best. We managed to get the rate of descent under control and were debating what to do next when the curtain for the big show went up. Suddenly we hit another down-draft and the nose dropped like a rock. I hauled in full aft cyclic control to stop it, but got no response. "Hauled" seems a harsh word for a helicopter that handles like a fighter and flies with two fingers; but that's exactly how I got the control movement. It was instinctive and instantaneous. You may not agree with the use of that much control displacement, especially aft, but you weren't looking straight down on those rocks either. As we moved the cyclic back toward neutral, we hit the end of the down draft and rode into an updraft about twice as big. Immediately I got all that control effect plus the change of direction as we started heading for the roof again. The nose came up at a frightening rate, and full forward cyclic wouldn't hold it. This takes a long time to tell about, but I don't believe it lasted over five seconds to this point. Seriously, I did not know whether or not the H-19 had been looped, but I was sure she was going to try this time. The book states,

(Continued on page 72)

SAC Silver Jubilee Newsreel

BY JACK PATTON

AC, Aeroquip Corp., A. P. Parts Co., Bendix Products Div., B. F. Goodrich, Delco-Remy, Eclipse-Pioneer, Glidden Co., Gould Nat'l Batteries, Grimes Mfg. Co.

Introducing new products and new ideas to fixed base operators throughout the southwest, SAC's famous "Flying Salesmen" covered the market in Luscombe Silvaires for several years after WW II. Here, VP Paul Kennedy (in plane) briefs a 1947 sales mission for his young pioneers in aviation distribution.

Hamilton Standard, Lycoming, MacWhyte Cable Co., Montrose Div. (Bendix), New York Air Brake, Pacific Div. (Bendix), Packard Electric, Pesco

In close harness with manufacturers, George Jalonick works to further improve his "services of supply" to airlines and overhaul firms. At immediate right, Sales Mgr. Don Morse of Bendix Scintilla (standing, left) joins him to check SAC's Scintilla inventory records. The other photo shows Jalonick receiving the Dallas Jaycee Wright Brothers Medal for community achievement.

Pioneer Central Div. (Bendix), Pratt & Whitney Aircraft, Red Bank Div. (Bendix), Scintilla, Skinner Div. (Bendix), Utica Div. (Bendix), and Willard Batteries

1932 —A QUARTER CENTURY OF LEADERSHIP— 1957

Southwest Airmotive Co.

LOVE FIELD DALLAS

DIVISIONS: KANSAS CITY, KANSAS / DENVER, COLORADO

DEPENDABILITY and ECONOMY

PYE

Low power AM mobile radiophone

..."reporter"

Ideal for use in: Airfield crash trucks, tow-tractors, gas trucks, police cars, executive cars and airline service vehicles.

Effective communication at maximum economy. Highly efficient noise limiting, nearly *MAINTENANCE-FREE* operation, easy alignment, minimum battery drain—no alternator or H.D. generator necessary— has transmitter "filament off" switch. Mounts easily under dash board without special tools.

Frequency Range: PTC 117 covers 118-132 and 144-174 mcs.
Input Voltages: 6 or 12. Also 24 VDC or 117 VAC optional extra.
Transmitter Power Output: 1 to 1½ watts over frequency ranges.

A few exclusive territories for experienced mobile radio communication distributors still open.

PRICE: $298.00 complete F.O.B. New York City

Literature on Request

PYE CORPORATION OF AMERICA
Telecommunications Division
1149 Raritan Avenue, Highland Park, N. J.

SIMPLIFY NAVIGATION

With modern, easy-to-use Warner computers and plotters! Our devices are suitable for the student as well as the private, business executive, commercial and airline pilot. Every unit includes a basic 360° protractor which unquestionably simplifies the measurement of directions.

WARNER E-1 COMPUTER:

Most versatile of all modern computers. Combines a standard computer with a host of conversion markers, a 360° protractor, a runway computer, a pressure pattern computer and wind vector scales with no limit on air or wind speeds and which require NO plotting for a quick solution.
List price $6.00

WARNER PLOTTER:

For years the best plotter on the market! Includes a straightedge with distance scales to fit the air navigation charts, a 360° protractor which is rotatable. This feature simplifies and reduces errors in plotting courses, bearings, wind vector solutions. Scales are provided for variation and deviation corrections, also for making off-course corrections from checkpoint information.
Statute Miles Scales $2.00
Nautical Miles Scales $2.50

WARNER PLOTTER-COMPUTER:

A combination device with all the features of the Warner Plotter PLUS a standard computer! The computer provides solutions for speed-distance-time, fuel consumption problems, conversions, air speed and altimeter corrections and a seconds index for approach procedures.
Statute Miles Scales $3.00
Nautical Miles Scales $3.50

Warner Instrument & Sales Company
4734 N. Austin Ave. • Chicago 30, Illinois

CAA RATINGS in a Hurry!

CAA EXAMINERS ON STAFF

Attend a school where personalized instruction allows you to get your CAA ratings immediately.

- The largest flight school in the U. S.
- Centrally located, good weather all year.
- Free placement service.
- Largest supplier of pilots to the nations airlines.
- Only flight school in U. S. using fully automatic link trainers.
- Ground school and Flight school.
- Operates seven days a week.
- CAA examiners on staff.
- VA and CAA approved.
- Courses start every Monday, no waiting.

ROSS SCHOOL OF AVIATION

MAIL TODAY!

ROSS SCHOOL OF AVIATION
Box 7071-E, Municipal Airport, Tulsa, Oklahoma

You bet I'm interested. Without obligation, please send me information on the courses checked below:
☐ Instrument ☐ Commercial
☐ Airline Transport ☐ Flight Instructor
☐ Multi-Engine ☐ Link Instructor
☐ Executive and Business Pilot Proficiency Course
Name ..... Age .....
Address .....
City ..... Zone ..... State .....

(Continued from page 70)

"This helicopter is restricted from acrobatics."

Until now the only forces or vibrations noticeable had been the G load when we changed direction at the bottom of the down draft. Never before or since have I felt anything like what followed. Now an intense vibration set up and the aircraft rolled to the left. At this point we were almost vertical. After we had turned about 90 degrees, the ship fell off to the left. The nose dropped radically and we made two vicious 360 degree turns like an airplane in a spin. All this time, we had been fighting to get the collective pitch down and get into autorotation—the best blade stall recovery technique. Perhaps the aerodynamic forces on the head were too great. Perhaps any number of things happened. One thing I am sure of—the collective pitch would not go down! After the second turn, we managed to get into autorotation, start breathing again and high tailed out of there fast. Eventually we got back to K-18 and set the bird down very gingerly. The helicopter isn't built for that sort of thing and we didn't know what had been strained or broken. We were still shaking when we got out. Our crew chief wasn't in the best shape either. He had been lying down when the fun started and watched the whole hideous performance through an 18 x 18 inch window. Evidently, getting a cocktail shaker treatment inside of the cargo compartment hadn't shown him too much.

We spent the next day shaking the helicopter down and writing to the factory of how much we appreciated the way the machine was built. The next trip across the mountains was uneventful. But I had learned about blade stall. END

Advice to Flying Fathers

(Continued from page 45)

Most children will cooperate if the danger of the situation is thoroughly explained to them, and this should be done at home, not at the airport. Since children strive to imitate their elders, don't thump the fabric or kick the tires in front of them.

Most difficulty with the youngsters on long flights is caused by two things; (a) they are uncomfortable and (b) they can't see out well. This can be remedied by providing cushions to raise them to adult eye-level. It puts the belt in its proper place across the pelvic region, rather than across the abdomen where it will tend to ride on a small child in a large seat. In case of a hard landing, a belt across the abdomen might injure a child. Cushions are also a safety precaution. Avoid taking children in company with an older person who is apprehensive of flying. Children sense uneasiness and can be badly frightened by it. For the most part, they take to flying like a duck to water, and with a little beforehand indoctrination, are the best passengers you will ever have. A little girl of three who rode with me for the first time got out and hugged a landing gear strut. Planting a kiss on it, she said, "I love you, Airplane!" And darned if that old airplane didn't quiver a bit, or maybe it was just an oleo settling! END

Hangar Flying

(Continued from page 20)

runway. I just sat there and blew out a long sigh listening to the sweet sound of the idling engine.

Suddenly realizing that I should get off the runway, I taxied the plane real slow and easy up to the hangar to be greeted by a much relieved instructor. They cut my shirt tail off, in true tradition, and tacked it on the blackboard. There was friendly kidding and excitement. But no one could share with me this one moment of my life when I, in spite of my fears, was master in the end. . . .

RAY L. BREWER, M.D.

Houston, Tex.

CLUB FLIGHT PLAN

INDIVIDUAL club flight plans have proven valuable aids to safety, flight supervision and bookkeeping for the Lazy-8 Flying Club located at the Municipal Airport, Akron, Ohio.

Conceived and designed by club instructor, Gene Cooley, they serve the

Instructor Cooley checks club flight plans.

same purpose as the CAA flight plans. Club members or Cooley need only to check a clipboard to which they are attached to locate a club's airplane.

The flight plan serves also as a positive fuel check for whoever flies the plane next. The member must enter the gas capacity in gallons and hours on it. "When a pilot has to put down the amount of gas in gallons and hours he'll never forget it," says Cooley. The plan also gives the club instructor good safety control over the flying activities because out and return routes must be recorded. Departure and return time must also be noted. By requiring members to file this information, Cooley feels that they will form lasting safety habits in planning all flights.

Another advantage is that starting and ending time on the recording tachometer must be entered for record keeping purposes before and after every flight. The flight plans serve as bookkeeping aids as well. When a flight is completed, the pilot has an exact record of his flying time. He then encloses the payment for the flight time into one of the envelopes located next to a locked, slotted wooden box and drops the money into it. The completed flight plan goes on the clipboard at the side of the box and is later collected by Cooley who checks it against payment.

ERNEST STADVEC

Akron, Ohio

COLONIAL C-1 SKIMMER AMPHIBIAN

SPEED - COMFORT - UTILITY - ECONOMY

FASTEST single engine amphibian—faster than landplanes of the same horsepower.

EASY to fly—land or water—wide retractable tricycle gear—excellent visibility.

PERFORMANCE—stalls below 50 m.p.h.—short takeoff on land or water—carries 725 lbs. at cruise up to 128 m.p.h.

COMFORT—cabin wider than more expensive landplanes

CONSTRUCTION—built to last—all metal, every part individually alodined and primed prior to assembly Tricycle landing gear.

PRODUCTION—the Model C-1 SKIMMER Amphibian is now in operation throughout the United States and Canada.

FAF price $16,250 including constant speed propeller.
Subject to change without notice.

Write factory for additional details.

COLONIAL AIRCRAFT CORPORATION
SANFORD, MAINE

SAY YOU SAW IT IN FLYING

FORD "TRI-MOTOR" AIRPLANE

Wasp 1340 Engines
New Exterior Paint
Immediate Delivery

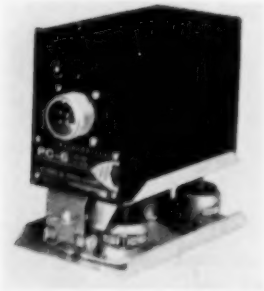
New CAA License
New Interior
Will Trade

$47,600.00

JACK ADAMS AIRCRAFT SALES, INC.

PHONE: EXpress 1-4436 P. O. BOX 5464
Memphis, Tennessee

Available NOW



FLITE-TRONICS
14VDC to 28VDC
PC-6 POWER CONVERTER

DESIGNED TO OPERATE LIGHT AIRCRAFT 28VDC GLIDESLOPE RECEIVERS

Installation of a LIGHT WEIGHT and COMPACT PC-6 provides 28VDC power supply in aircraft with 14VDC electrical systems. Instruments and other equipment requiring 28VDC and up to 50 Watts of power can be operated continuously. The PC-6 replaces the DY-20 rotary converter.

The PC-6 has been transistorized to provide maximum reliability and performance.

PC-6 SPECIFICATIONS

Weight . . . with shock mount, 1 lb. 7 oz.

WIDTH	HEIGHT	LENGTH
2¼"	3⅛"	4⅞"

INPUT	OUTPUT
13.5VDC	28VDC
.50 to 4.5 Amp.	0 to 1.8 Amp.

LOAD RANGE 0 to 50 Watts RIPPLES 200MVP
TEMPERATURE RANGE—30 F. to 170 F.

FLITE-TRONICS, inc.
3312 Burton Avenue
BURBANK CALIFORNIA

SURVIVAL KITS

RESPONSIBLE EXECUTIVE PILOTS everywhere rely on our kits to protect their own and their passenger's safety on land or water.

"Global Master Kit C-2" sent on approval to rated firms in U.S.A. Write today for full particulars. State your problems. Give license number.

SURVIVAL EQUIPMENT COMPANY
Division of Victor Tool Co.
DEPT. 607 OLEY, PENNA.

Messenger to Australia

(Continued from page 30)

met. Across the Strait of Malacca perfect weather held and we did some slight clowning as our plot estimated a crossing of the Equator. Indonesian officials at Palembang in Sumatra were charming and dispelled our previous fears. Their towers also understood the limitations of light aircraft and neither directed us to land in a 40 knot crosswind or parked us behind four engine airliners. Here too an inspection revealed a fatigued aileron hinge and Pat Hynes of Standard Vacuum Oil arranged for repairs in their workshop. We were happy to get the Messenger under cover to allow a thorough check-up before the Timor Sea crossing, soon to be on the agenda. Stanvac refused payment and lined the strip to wave as we departed for Djakarta where Qantas Airways welcomed us to their crew hotel. We made a dawn exit for Semarang where a flock of Indonesian Air Force Mustangs gave us a busy time in the approach. Transient civil aircraft en route through Indonesia must keep to a strict air corridor and at times this track led us into high ground beyond the Messenger's abilities. However, we arrived unintercepted at famous Bali which has an approach over impressive surf to its airfield at Den Pasar. With weather now reasonable, we could admire the scenic beauty—the myriad greens contrasting with rugged extinct volcanos and craggy mountains.

At Den Pasar we met a crew of Dutchmen flying a 4-engined D. H. Heron and arranged to get weather reports in the air as they would be well ahead of us on our next leg. Our VHF radio, though heavy, was capable of phenomenal range and for most of the next day we had half-hourly reports from the Heron 100 miles and more in front of us.

We island-hopped to Wangapui in Lower Soemba—a three hour run over the Sawoe Sea. Wangapui has a field with a hill off the end of the runway which sometimes outclimbs contesting aircraft. We filled our tanks well and did a climbing turn around this obstacle. Most of the wartime airfields shown on our map were no longer visible. Jungle growth has reclaimed them. A mighty headwind took over after we had passed our point of no return. This leg was well covered by our extensive reserve tankage but we got annoyed at such slow progress. Finally we landed at Koepang, where the thoughtful Dutchmen had put out a flare path for us. Immediately after landing we turned off the runway into what appeared to be a taxi track and soon were lost in high grass. After ten minutes of exchanges with the Tower, a jeep nosed through the growth and gave us a tail light to follow to the parking area.

Crossing of the Timor Sea to the Australian Mainland might take about six hours. A previous crossing by a light aircraft had produced a ground speed for them of only 50 knots. Arthur's friend, Martin Cherry and his bride had flown a Percival Proctor out from Britain a year before. They set off from Koepang headed for Darwin, but were never seen again. A search aircraft reported sighting a blue cushion some 300 miles out, but nothing else. Thus we chose to sit down for a favorable weather report, for as long as necessary. It was a short wait. We were unlikely to better the forecast of the next morning, so we filed a flight plan which set course for Wyndham rather than Darwin. The track to Wyndham would put us over land an hour earlier than the Darwin plot. There is no single spot of land between Timor and Australia nor is the track on a shipping route. On the edge of the land mass is Drysdale River Mission which has a pedal-powered radio and would report us to Darwin Control. Drysdale, with an emergency strip but no fuel or facilities, assumed an important place in our thoughts for the next few hours.

We used all the runway, hauled the Messenger into a slow climbing turn with its back-breaking fuel load and settled down to our previous over-ocean routine of drifts—plots—wind pattern observations—fuel pumpings and conferences.

Next Month
in
FLYING
"Transition to Twins"

Howard Graves, Chief Check Pilot for Piper Aircraft, discusses procedures developed by his company for single-engine pilots making the important transition to multi-engine flying.

The cloud base behaved well with patches at 1,000 feet creating misleading shadows and mirages which became more convincing as the fourth hour ticked by. We were laying off 20 degrees of drift and ground speed was down but not alarming. We both suddenly saw two very convincing mirages on the horizon. This pair could add up to Mount Leeming and Mount Connor to the south of Drysdale River and Wyndham respectively which would put us right on estimated landfall. Soon we were over coral shallows just off the coast and all the pieces fell into place, including the white mission building at Drysdale River which we buzzed at 800 feet and altered course a few degrees for the next hour and a half to Wyndham.

So we were home, and we got quite a kick from the Australian accent on the Tower radio. We felt at home although we still had 3,000 miles of the Australian continent to traverse before the Messenger could be handed over. We flew 203 miles up to Darwin next day to officially enter our country. The featureless expanses of our home continent were the toughest navigational task of the entire trip, but we preferred the natural hazards to the intangible official nuisances which had plagued us en route.

We met many bush flyers on the way south and gained even more respect for the outback free lance flyers and feeder services—the only link for many a lonely

(Continued on page 76)

Okanagan pilots flying Bell and Sikorsky helicopters carry men and materials into otherwise inaccessible locations.

"Aeroquip Simplifies Hose Line Replacement at Our Maintenance Base or in Remote Areas"

"WE USE AEROQUIP EXCLUSIVELY ON OUR HELICOPTER FLEET"

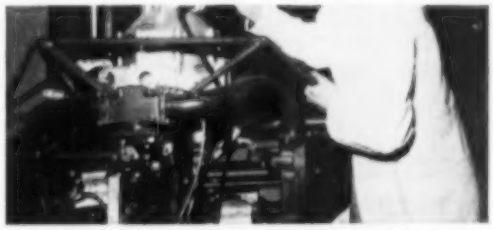
Reports Alfred Stringer, V. P. in charge of operations, Okanagan Helicopters Ltd., Vancouver, B. C.

Operating the Okanagan fleet of 29 helicopters throughout Canada calls for unusual maintenance procedure. Craft are often assigned to extended surveys in remote areas, and licensed air engineers must accompany pilots to make periodic inspections and emergency repairs.

That's why the Okanagan Group has standardized on dependable Aeroquip Hose Lines for replacement applications at the base and in the field. Aeroquip Bulk Hose and Detachable Fittings can be assembled at the Vancouver maintenance base or in remote areas. And, replacement costs are lowered because Aeroquip Fittings can be used again and again.

Whether you operate commercial, business or private aircraft, let the 'Aeroquip idea' simplify your replacement needs, too. Call the Aeroquip Distributor at your air terminal, or write us for information.

Aeroquip Hose Lines are assembled as needed, using ordinary bench tools.



This air engineer is installing an Aeroquip Hose Line on the Franklin Power Pak of a Bell helicopter.

Aeroquip

REG. TRADEMARK

DISTRIBUTED BY:

Aero Hardware & Supply Co., Miami Springs, Florida
Air Associates, Inc., Chicago, Illinois
Airwork Corporation, College Park, Ga.
Amnor Aviation Corp., Mamaroneck, N.Y.
Faxon Engrg. Co., Inc., Hartford, Conn.
Gen'l. Aviation Supply Co., Inc., Houston, Texas; Oklahoma City, Okla.; St. Louis, Mo.
Gen'l. Aircraft Supply Corp., Detroit, Mich.
Aero-Land Supply Co., Oakland, Calif.
Nielsen Hydraulic Equipment Co., Pelham Manor, New York
Southwest Airmotive Co., Dallas, Texas; Denver, Colorado; Kansas City, Kansas.
Van Dusen Aircraft Supplies, Minneapolis, Minn.; Teterboro, New Jersey; Chicago, Illinois; Alexandria, Va.
Air-Parts, Inc., Burbank, California
Aviation Service & Supply Co., Denver, Colorado
Richey Air Sales, Inc., No. Hollywood, Calif.
Sky-Store, Hawthorne, California
Spencer Aircraft Industries, Inc., Seattle, Washington
Field Aviation Co., Ltd., Oshawa, Ontario, Canada
Lund Aviation Ltd., Dorval, P.Q., Canada

YOUR AIRCRAFT IS ONLY AS GOOD AS ITS

PILOT

80% of all corporate aircraft owners rely on PEA, specialists in supplying skilled pilots.

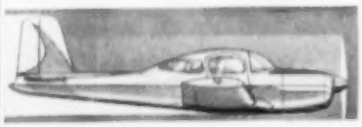
PEA PILOTS EMPLOYMENT AGENCY

Teterboro Airport 3, New Jersey, ATlas 8-1214

3315 Burbank Blvd., Burbank 3, California, THornwal 5-3646

MEYER'S

200



ENGINEERED & DESIGNED to assure SUPERIOR PERFORMANCE

Spin Resistant

Gross Weight 3000 Lbs.

Empty Weight 1870 Lbs.

Tricycle Landing Gear

Continental 240 HP.

All Metal—Four Place

Cruise 185—Land 55

Range (Optional) 1000 Miles

360° Visibility

Write Today for Details

MEYER'S AIRCRAFT CO.

Tecumseh - Mich.

Dealer Inquiries Invited

IN NEW YORK

Touch Down

AT

ZAHNS AIRPORT

AMITYVILLE, LONG ISLAND

Serving Greater New York

Hard surface runways 4200 • Unicom Teletype • Direct line to ATC and INSAC • Instrument approach ADF • Runway lighted all night • Rotating beacon • Motel

Air Taxi • Charter flights

Hertz rental cars

Gov't. approved Airplane and Helicopter flying school

Sales • Service • Storage

Tel.: Amityville 4-4200

(Continued from page 74)

homestead with civilization. Finally, on a wintry afternoon we presented the Messenger to its owner, Cliff Wynne at his private field at Yarram, Victoria in the south-west corner of Australia.

He asked: "Would you do the flight again?"

We replied: "Yes, but we would have to do the trip twice more to be fully efficient at it."

"Why is that?" He asked.

We answered: "Well those 'officials' on the route at every point work 24 hours a day in three shifts—and so far we've only met one team!" END

Flight Briefing for the Businessman

(Continued from page 46)

appointments. The initial session begins with an outline of the theory of flight followed by a briefing in the control tower on traffic procedures. The next half hour is spent in the air studying the effect of controls in flight.

Next time out the student is briefed in the use of radio for communication and navigation and visits the CAA Airways Control Center. Also, he reviews his first flight and is given coordination exercises in flight.

A tour of the CAA Weather Station begins the third hour which is followed by another review of flight procedures, and a demonstration of power-on and power-off stalls.

The final hour is devoted to a discussion of cross-country planning and an analysis of aircraft maintenance along with a final rechecking of flight maneuvers. The Course is well within the reach of the average pocketbook including two hours of flight instruction in a Cessna 172, only $40.

While Dixie's program was designed originally to reach the potential corporate flier, it has developed into a public relations tool that merits the attention of all operators.

"Take a look in any major airport," Miller will tell you. "You'll see maybe 100 businessmen awaiting departure and all they know about aviation is how to get on and off an airliner. They wonder about the weather, are mystified by such things as engine run-ups, and fret over unexplained delays. After completing this course, the businessman knows generally the procedure for his flight and can reassure his seat mate that an occasional turn or change of altitude does not mean that something is wrong."

The course is geared to the needs of still another group—pilots who haven't been in the left-hand seat in a long time. One case in point was a World War II Air Force pilot. Out of the cockpit for ten years, he had no radar approach or omni experience, was hazy about civil airways, and was equally vague on airways control and civilian flight planning. Today he's happily investigating the possibilities of business flying.

One far-seeing corporation pilot enrolled his wife in the course! Now she understands her husband's job. If you wonder what advantage that could be—you plainly are not a married man. END

SUCCESS STORY–1957

August, 1957 Young engineer gets vacation with pay.

June, 1957 Moved into his new home.

May, 1957 Promoted to Asst. Chief, Stress Analysis Group. Salary increased to $550.00.

July, 1956 Accepted one of seven jobs offered. Started at $475.00.

June, 1956 Graduated from NORTHROP AERONAUTICAL INSTITUTE ...Had selected job before leaving school.

July, 1954 Enrolled at Northrop Institute in two-year Aeronautical Engineering Course.

April, 1954 First heard about Northrop Institute. Sent for catalog. A really lucky day for him.

In a little over TWO YEARS FROM TODAY—you too can write a similar success story, **if you start to prepare now.**

Northrop

Aeronautical Institute

An Accredited Technical Institute
1175 W. Arbor Vitae Street
Inglewood 1, California

MAIL THE COUPON BELOW
FOR COMPLETE INFORMATION

NORTHROP AERONAUTICAL INSTITUTE RN17
1175 W. Arbor Vitae Street, Inglewood 1, California

Please send me immediately the Northrop catalog, employment data, and schedule of class starting dates. I am interested in:

- ☐ Aeronautical Engineering Technology
- ☐ Aircraft Maintenance Engineering Technology
- ☐ Master Aircraft and Engine Mechanic
- ☐ Jet Engine Overhaul and Maintenance

Name _____ Age _____

Address _____

City _____ Zone _____ State _____

Veterans: Check here ☐ for Special Veteran Training Information.

GLASCO-AIR
fiber glass conversions
pat. pend.

caa approved under class "c"—no underneath fabric tests required

Increases strength • Decreases fire hazard • Eliminates fabric maintenance and recover problems • Lowers noise level and helps stabilize cabin temperatures • Increases resale values and performance • Highly resistant to hail, problice, and other in flight and on-the-ground weather hazards • Unaffected by harsh dusts and sprays, gasoline, oil, etc. • Will not dent yet harder to damage than most metals • Easy and inexpensive to repair • Will not deteriorate, will not rust or corrode • Extra Light Weight (adds only 15-30 lbs. to light aircraft) • Retards airframe corrosion • Competitive.

contact GLASCO-AIR
West 5th St. Airport
Oxnard, California
HUster 3-4004
for full details

ATT: AIRPORT OPERATORS
DEALERSHIPS AVAILABLE
Write Today for Full Details

When you need
NAVIGATION AIDS or
INSTRUMENTS

DO AS MAJOR AIRLINES & U. S. AIR FORCES DO

depend on WEEMS

Fly for pleasure? For business? Whether you're a pilot or student, for accurate navigation you need instruments you can absolutely rely upon. That's why it pays you to select your requirements from the world-famous **Weems** line where you'll find many instruments which are standard equipment with the U. S. Air Force and Navy, as well as major airlines like Capital, TWA, Pan-American, Eastern, Braniff and others.

NAVIGATION "MUSTS"

For student and pilot alike navigation essentials include **Weems Mark II Plotter**. Scale fits sectional and world air charts. Statute miles. Only $2.00. **New Weems Mark II-N Plotter** differs from Mark II in that distance scales give nautical miles on sectional and world air charts. Only $2.50. **Dalton E-6B Computer**—two sides. One for computations, other for vector problems. Only $10.00.

Free 26-page Weems Catalog describes in detail these and many other essential navigation aids and instruments including latest air navigation books. Also tells you about **Weems Air Navigation School**, est. 1927. Send for free catalog today—address Dept. 5. Weems System of Navigation, Annapolis, Md. or see your aviation supply dealer.

The Garrett Story

(Continued from page 43)

setups for customers. Before the initial year was out, the Aircraft Tool and Supply Company became the Garrett Supply Company, and through it, eastern manufacturers were supplied with accurate requirements for specialty tools needed by aircraft manufacturers on the West Coast.

The Supply Company proved a success from the start, paying a dividend after the first year, and establishing a financial standard which has remained unbroken throughout the history of The Garrett Corporation. By way of explanation of this change in name and subsequent expansion—between 1936 and 1939, the complexion of Garrett's entire operations changed considerably. The growing aircraft industry demanded more and more engineering services as time went on, and this in turn led Garrett to extend his initial operations. Airsupply, a sales and engineering organization, came into being in 1938. It dealt exclusively with aviation customers. Garrett Supply up to this point had served general industry, rather than exclusively the aviation field.

In 1939, Garrett formed his first manufacturing concern, AiResearch Manufacturing Company, and now decided to incorporate. The embracing structure became The Garrett Corporation (1939) and the three operating companies became divisions; i.e., Airsupply Division, the Garrett Supply Division and AiResearch Manufacturing Division. With this expansion and change in structure, Garrett Supply became essentially a distributor of general tools and industrial supplies. Its functions were expanded beyond the aircraft field and the division now serves practically all major industrial enterprises in the Pacific and Southwest.

Airsupply was staffed originally with aeronautical engineers who, in the beginning, specialized in pushing development of accessories with direct application to aircraft. Their work began on a drawing board and continued through flight test and field services. Airsupply, vastly expanded, continues these functions today, covering the United States west of the Mississippi. While AiResearch Manufacturing Company led Garrett to become a leading manufacturer of aircraft components, it was Airsupply that paved the way initially with its sales and engineering contacts.

Fundamentally, the AiResearch Manufacturing Division of Garrett was created to anticipate the needs of aviation against the time that high speed, high altitude flight, would impose its problems. Heat transfer equipment became the company's initial major development endeavor. The first design was an automatic oil temperature regulator for aircraft. A genius with a background in automotive cooling, Walter R. Ramsaur, joined AiResearch. Out of the effort came the first all-aluminum inter-cooler for supercharged aircraft engines which could be mechanically assembled for large scale production. But as production orders began to materialize Garrett was met with a new problem: he could find no one to manufacture his products. Most fabricators were unwilling to tackle aluminum work of such fine tolerance.

AiResearch then began manufacturing on its own with production orders for Boeing B-17 intercoolers and Douglas A-20 oil coolers. Work at a small plant in Glendale, Calif., the initial site, was moved in 1941 to its present manufacturing facility adjacent to Los Angeles International Airport. Here also provision was made for laboratory facilities in high altitude research. One of the chief problems in high altitude, high speed flight would be pilot and crew survival. Garrett himself was an experienced pilot by this time. His hangar flying with engineers always revealed that they saw possibility of cabin pressurization for passenger aircraft—20 years hence. Cliff disagreed. He secured from Boeing a license to develop their cabin pressure regulator for production. In two years, Garrett had the only fully developed cabin control pressure system in the United States. It subsequently made the B-29 the first production pressurized aircraft.

With the outbreak of World War II, Garrett established the AiResearch Manufacturing Company of Arizona, Inc., at Phoenix. The primary purpose of this inland plant was to obtain volume production for articles designed and developed by the parent corporation. During the war, Garrett commuted by

(Continued on page 80)

THE SHORTEST DISTANCE BETWEEN TWO POINTS...

IS WITH THE

RDF-IA RADIO COMPASS

AIRCRAFT SPECIALTY LINES
A UNIT OF SAVAGE INDUSTRIES
10200 N. 19TH AVE., PHOENIX, ARIZONA

FOR BIG EARNINGS IN LESS TIME!

SPARTAN TECHNICAL TRAINING is the shortest road to the best jobs and highest earnings in aviation. Spartan's modern methods take only 14 months to train Aircraft Engine Mechanics, only 19 months for Flight Engineers. Where else can you equal these opportunities to step so quickly into the big earnings bracket? Write TODAY for our new brochure "AVIATION OPPORTUNITIES."

SPARTAN SCHOOL OF AERONAUTICS
MUNICIPAL AIRPORT, TULSA, OKLAHOMA

Maxwell W. Balfour, Director — Dept. F-77
Spartan School of Aeronautics
Municipal Airport — Tulsa, Oklahoma
Please send complete information immediately.

Name _____ Age _____
Address _____
City _____ State _____
Indicate which of the branches interests you:

- ☐ **Aircraft and Engine Mechanics**
- ☐ **Instrument Technician (Standard and Electrical)**
- ☐ **Flight Engineer**
- ☐ **Link Trainer Instructor**

☐ Vet. ☐ Non-Vet.

Spartan is approved for training under the G. I. Bill of Rights

$100,000.00
GROUP ACCIDENT INSURANCE
exclusively for
PILOTS & AIRCRAFT PERSONNEL

PAYS UP TO $100,000.00 for any accident resulting in death or loss of any *ONE* hand, eye or foot.

IMPORTANT INFORMATION

1. Savings to 50% from regular rates.
2. 100% Principal Sum paid for loss of any one hand, eye or foot.
3. 24 hour protection in the air, at home, on the road, at work, around the World.
4. Underwritten by the World's oldest Insurance organization, Lloyd's, London.

GROUP RATES to age 65*

AMOUNT	ANNUAL PREMIUM NON-PILOTS	PRIVATE PILOTS	COMMERCIAL PILOTS
$100,000	$90.00	$490.00	$590.00
50,000	45.00	245.00	295.00
25,000	22.50	122.50	147.50
10,000	10.00	50.00	60.00

*Non-Pilot rate includes coverage as a passenger in commercial, private or military aircraft. Pilot rate includes coverage for operation of all types of civilian aircraft.

MAIL COUPON NOW!

Professional Associates, Administrators
Pilots & Aircraft Personnel Group Accident Ins.
Suite 863, 120 South La Salle Street
Chicago 3, Illinois

PLEASE RUSH FULL INFORMATION AND APPLICATION TO:

Name _____

Address _____

City & State _____ Age _____

SAY YOU SAW IT IN FLYING

WORLD'S MOST AMAZING BARGAIN CATALOG

396 PAGES
The LARGEST COLLECTION of BARGAINS ever assembled in one catalog!

NATIONALLY ADVERTISED MERCHANDISE • NEW and USED GOV'T SURPLUS • FACTORY CLOSE OUTS • EXCITING IMPORTS!

This catalog lists the largest selection of AIRCRAFT PARTS, SUPPLIES and HARDWARE in our history! Included are Engine, Flight, Navigation & Servicing Instruments, Auto Pilots, Radio & Radar equipment, genuine AN & AC Fittings & Hardware, plus the greatest array of HYDRAULIC Cylinders, Pumps, Valves, Motors, Plumbing, etc., we've ever had. You'll have to see it to believe it!

Send 50¢ (for handling & mailing) LIMITED EDITION! ORDER YOURS NOW!
50¢ REFUND on your first order of $1.00 or more.

Palleys 2263 E. VERNON AVE., DEPT FY-, LOS ANGELES 58, CALIF.

LATEST OFFICIAL AIRCRAFT PHOTOS

Rockets, Jets, Historical planes.
All makes, hundreds from wh ch to choose.
SPECIAL INTRODUCTORY OFFER
with your name and address. Send only 25¢ select one packet.

1. 4 3½x5 photos, world's fastest Jets.
2. 4 3½x5 World War II planes.
3. 4 3½x5 of Rockets, Missiles.
4. 1 8x10 photo Boeing B-52 Jet Bomber.
5. 1 8x10 photo Lockheed F-104A Starfighter.

All five packets for $1.00

$2 VALUE FOR $1

Large illustrated catalog free with each order

MAIL YOUR ORDER NOW . . . TODAY

AVIATION PHOTO EXCHANGE
Dept. FF, Box 75084, Los Angeles 5, California

(Continued from page 78)

airplane between his Los Angeles and Phoenix plants. His manufacturing divisions broadened their production output of aircraft accessories to include automatic exit flap controls, engine coolant systems, engine oil and air intercooling systems and supercharger aftercooling systems.

Like all aircraft manufacturers, Garrett faced real problems in 1946. War contract cancellations knocked the bottom out of the industry. Cliff trimmed his working force from 4,500 to 600 and elected to remain in the aviation business. Wartime research in pressurization and air conditioning now paid off in commercial aviation. Garrett became first to supply these systems for such new transports as the Lockheed Constellation, Convair 240 and major components for the Douglas DC-6 and Boeing Stratocruiser. Most of the systems were also adaptable to turbojets, whose speeds and altitude ranges were posing a whole new set of accessory problems.

With ever-increasing numbers of his accessories in service in both military and commercial aviation, Garrett conceived the idea of establishing a maintenance and overhaul facility near the home plant in Los Angeles. The AiResearch Aviation Service division was founded in 1946 and is located at Los Angeles International Airport. This company provides complete engineering and service facilities for the overhaul, maintenance, rebuilding, and modification of all types of aircraft. It offers full engineering and fabrication services for specialized equipment, component systems, interior furniture, test equipment, structural modification, mock-ups, and cargo handling equipment. Aviation Service also has a large radio and electronic operation.

With the outbreak of the Korean conflict and the attendant build-up in national defense, Garrett returned to Phoenix to establish an inland manufacturing facility which would meet strategic demands for disposal of vital industry. The AiResearch Manufacturing Company of Arizona was housed in a five million dollar company-owned facility which won national honors as one of the most modern plants in the United States. Nearly six million more has been added in an aircraft accessory test facility. Today, Garrett's AiResearch manufacturing divisions at Los Angeles and Phoenix are producing more than 1,000 different models of components for use on airplanes and missiles. This great diversity of components has been achieved in the face of increased demands for miniaturization, operating efficiency and durability.

In 1954, the Garrett Corporation grew strongly in many different directions at once. For one thing, Garrett Supply acquired the McConkey-Docker supply house in Phoenix, and this office became the Phoenix branch of the subsequent Garrett Supply division. Also, in the same year, Garrett purchased the Aero Engineering Company of New York which ultimately became the Aero Engineering division of the Garrett Corpora-

tion. It handles sales coverage in the eastern part of the U. S. with head offices in Mineola, N. Y., and branch offices in ten eastern cities. In addition to acting as the sales and engineering division for the AiResearch Manufacturing divisions, Aero Engineering represents other non-competing aircraft accessory manufacturers in the area east of the Mississippi.

In this same year of 1954, the Air Cruisers division of The Garrett Corporation was established and its plant specializes in the manufacture of rubberized inflatable survival equipment as well as the fabrication of fiberglass, polyethylene and other products. On June 29, 1956, Air Cruisers took over the activities of the Northill Company, Inc., manufacturer of lightweight anchors and underwater breathing equipment.

The Garrett Manufacturing Corporation of Canada, Ltd., was also established in 1954 as a subsidiary of the parent corporation in Los Angeles. This particular subsidiary engages in the production and overhaul of components for Canada's aircraft industry and also represents Garrett's manufacturing divisions and other manufacturers who are on the Canadian market.

The year 1955 was also outstanding. It was decided to increase the Garrett Supply division's scope of activities and thus was purchased the 80-year-old industrial supply house, C. W. Marwedel of San Francisco. Although Marwedel is a subsidiary corporation, it also functions as a member of Garrett Industrial Supply Operations which with its offices in Los Angeles and Phoenix, now serves a tremendous area of major industries in the west.

In 1955, Garrett took a momentous leap into another kind of business. With an initial order from Caterpillar Tractor Company, he set up a plant to manufacture turbochargers for all types of diesel engines and thus the AiResearch Industrial Divisions was created. Since its formation, this division has gone on to design other models of its diesel turbochargers and has also designed fuel scheduling systems for industrial diesel engines and industrial valves of a specialized nature.

To continue exploration into the unknown, Garrett's newest unit, the Rex Division, was formulated in 1955 to conduct high priority classified research for the military.

Today The Garrett Corporation encompasses nine divisions and two subsidiaries which are engaged in highly diverse activities and operate internationally on a worldwide scale. Employment at Garrett has jumped over the 11,000 mark.

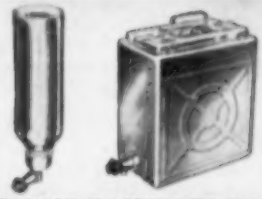
It is a far cry from the resolve of a high school boy in 1926 to the complicated industrial structure of The Garrett Corporation of today and an annual sales volume of over $150 million. But as I said in the beginning of this sketch, such has been the course of air history—imagination and creative ingenuity. We fly higher, faster and farther only because someone believes that we will and paves the way for the accomplishment.

END

one source

for every personal flying need

WEARING APPAREL—Top quality flight jackets, flying suits and caps. Special aviation sun glasses—maximum glare protection and true color vision.



VACUUM BOTTLES & CONTAINERS—Wide selection of stainless steel bottles, jugs, etc. . . . high thermal qualities, easy cleaning, non-breakable.

LOG BOOKS—Many types of pilot's, engine, aircraft logs. Generous space for entries required by CAA. Handy bound, attractive leatherette cover.

CRASH HELMETS — Latest design for maximum protection. Suspension type with one-piece fiberglas shell. Withstands high force, yet light and well ventilated.

Fulfilling personal flying needs is among Air Associates' vital services to aviation. The items pictured here are a part of a generous selection which provides not only comfort and flying enjoyment, but many serve as personal protection for the pilot. Air Associates is the ONE SOURCE where you can obtain virtually all your aircraft parts, maintenance equipment, safety products, and personal gear . . . over 2,000 quality products.

Ask your fixed-base operator for Air Associates products . . . YOUR BUY WORD for better equipment.

AIR ASSOCIATES, INC.

61 Industrial Avenue, Teterboro, N. J., U. S. A.

BRANCHES: ATLANTA • CHICAGO • DALLAS • SAN FRANCISCO • GLENDALE • MIAMI • TETERBORO

AIRCRAFT OWNERS AND PILOTS ASSOCIATION

AOPA NEWS

Aircraft Owners and Pilots Association is a service organization for the private pilot or aircraft owner. AOPA's full time staff is devoted to helping the individual pilot. Its aim is "To make flying more useful, less expensive, safer and more fun."

Headquarters address is Box 5960, Washington 14, D.C. Members also receive a special AOPA edition of FLYING, newsletters and confidential aviation data. Opinions expressed in this column are not necessarily those of FLYING Magazine.

LONG DISTANCE HELP

AOPA recently assisted one of its members to obtain a private pilot license although the member was in Germany with the U. S. Armed Forces at the time.

Clifford D. Ross (AOPA 142206), Nbg. Team, 7051st Air INRSERON, wrote AOPA that he had completed all phases of his training with exception of the flight test. He asked whether there was any way he could take the flight test in Germany.

Ross' problem was referred to the London, Eng., office of CAA's Office of International Cooperation by Fleet Haselden, head of the AOPA Service Department.

The AOPA'er later wrote another letter to AOPA Headquarters.

"As a direct result of your letter to the CAA, I was contacted by the CAA representatives in Germany and scheduled for a flight test," he said. "I am now the 'proud owner' of a private pilot certificate and have only to pass a written examination and two more maneuvers on the flight test for my commercial ticket. I am very grateful to AOPA for the help given me in the matter."

180° KNOW-HOW SPREADS

Directors of state aviation agencies in 30 states have responded to AOPA Foundation's request for their assistance in spreading AOPA 180° Rating instruction over the United States.

As a result of their activities, 180° Rating teachers now are available in more than two-thirds of the states. By the end of this year, the AOPA Foundation hopes to have at least one instructor in every state. Aviation agencies in Alaska, Hawaii, and Puerto Rico also have expressed interest in the program, and one or more of the territories probably will have instructors in the life-saving technique within a few months.

Early this year, the National Association of State Aviation Officials agreed to participate in the program by selecting one trainee from each state, who would take the course at the AOPA Foundation's expense at the University of Illinois, where the technique was developed under an AOPA Foundation grant.

The AOPA 180° Rating is a simple technique designed to enable non-instrument pilots to turn back to safety should they run into instrument weather accidentally. Tests made at the University of Illinois' Institute of Aviation while the technique was being developed showed that every non-instrument pilot who ran into such weather conditions theoretically would crash in 20 seconds to six minutes after losing visual contact with the ground.

INFORMATION STOREHOUSE

A vast repository of information on private flying is to be found in the AOPA membership files maintained at AOPA Headquarters in Washington, D.C.

In the approximately 150,000 file jackets maintained on current and former AOPA members are letters, newspaper clippings, photographs, and other materials showing the member's varied interests and problems in the aviation field.

No item from a member is too insignificant to find its way into the files after the required action has been taken in the appropriate AOPA departments. Mrs. Margaret Collins, who maintains the files, says there is more than one matchbook cover carefully filed away under some member's AOPA number. Each contains a message from a flyer to his Association's headquarters, which was written hurriedly on the only stationery at hand at the moment.

AOPA officials turn to the membership files quite often when a request for information or assistance is received from an AOPA'er. Very likely the same problem has come up before and a complete dossier is to be found in one of the 150,000 jackets. Members report all sorts of information to National Headquarters, such as the fact that a landing fee is being charged at a certain airport, or that drag races are held on the runway of a small town's airport runway on Sundays, or that there is good taxi service into town from Schmaltz' Airport at Schmaltzville. The records are replete with incidents reported by AOPA'ers which resulted in changes in Government regulations and airport and airways practices.

When the member files are required in National Headquarters work, they can be extracted and delivered to the appropriate AOPA department in a matter of minutes. If the member's number is known, getting his file is a simple matter. However, if the AOPA number is not available a little more time is required. It is necessary to check the name against the alphabetical file listings in order to get the proper AOPA symbol. Listed in the alphabetical file are the names of all pilots and aircraft owners who have belonged to AOPA since its founding in 1939.

Members have cooperated wholeheartedly in AOPA's request that they include their AOPA numbers when writing to National Headquarters. In this way they are assisting in the orderly expansion of the all-important filing system, which is taking place along with an expanding membership.

Keeping membership records of 65,000 AOPA'ers in order is a full-time job for AOPA's filing unit. Mrs. Margaret Collins, shown in the foreground seated at a filing cabinet, is in charge of the membership, or "201", files. Mrs. Aslaug Becker, standing, keeps the Association's alphabetical files, which contain the names of approximately 150,000 current and former AOPA'ers.

Cuban Air Cruise

(Continued from page 38)

the sky over Havana was covered with low broken clouds. Vern Burt, always a cautious pilot, decided to navigate the strange territory below cloud level, although the turbulence was rough to violent low over the mountainous areas. After more than an hour's flying over territory almost devoid of landmarks, Santa Clara showed up on course and was a welcome checkpoint after miles of royal palm wilderness. Soon the location of Mayajigua could be fixed by a road running inland from the north shore. The approach to the strip had to be low over the trees and cottages of San Jose.

A small detachment of rugged looking Cuban militiamen wearing sidearms and long trailing sabres were guarding the strip. They were disturbing reminders of the revolutionary fighting taking place in the mountains only a few miles to the east, but were eager to help get the airplanes accounted for and secured, and they provided a welcome guard over the ships throughout the night.

The Burts were assigned to a magnificent Polynesian style log cabin topped by a palm thatch roof that must have been 20 feet high at its peak. After a brief rest, they were aroused by the odor of roast pork and traced the savory smoke to a huge open fireplace outside a thatch roof patio where two young pigs and a number of chickens were sizzling over hot coals. Tropical fruits and vegetables were arranged around the fireplace, and soon bronze-skinned native girls were serving the meal on banana leaves. A grotesque air was added to the feast by tame flamingos strutting stiffly but nonchalantly among the crowds. They were always on the prowl, and whenever anyone took his eyes off his drink, one of the pink creatures would extend its snaky neck and bury its beak deep in the glass.

Next morning, nobody was sorry over the delayed departure caused by a light fog, but after the sky had cleared, Vern Burt climbed to 5,000 feet and in calm air he and his passengers enjoyed looking over the rich Cuban scenery. Santa Clara passed underneath, and soon after the mountains near Cienfuegos had slipped past the left wing, Havana with its blanket of smoke appeared over the Cessna's nose.

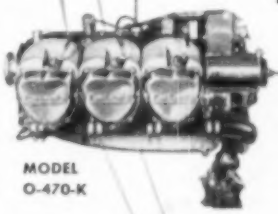
After a brief layover at Santa Fe Airport for border formalities and a fresh weather briefing, the tour was on its way home again over the Coast Guard protected Florida Straits.

Thanks to the thorough planning and careful direction of the tour there were no untoward incidents. In fact, in the 15 years of Miami-Havana Cruises, no one has ever been lost on the over-water hop.

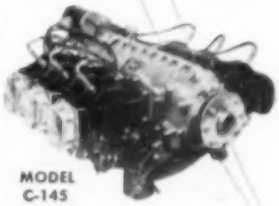
Because the Cuban Tours are becoming better known and more popular every year, separate tours are now being conducted by both the Florida Air Pilots Association and the Florida Aero Club. Since weather difficulties are experienced in midwinter, both cruises will be scheduled for the months of February or March next year. Detailed information regarding the two air tours will be made public at an early date this fall. END

Keep These Modern Facilities BEHIND THE PLANE YOU FLY

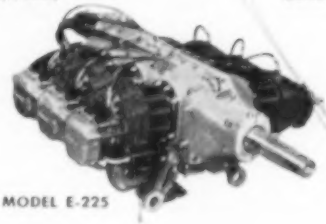
CONTINENTAL'S FACTORY RE-MANUFACTURE
Backs You with Factory Knowhow—and Precision Production Machinery—Throughout Your Engine's Life



MODEL O-470-K



MODEL C-145 (O-300)



MODEL E-225

No two ways about it: the men and machines that produced your airplane engine in the first place are obviously best qualified to keep it in top running condition. That is why Continental's Factory Re-Manufacture Plan is rapidly supplanting the periodic overhaul among users of utility planes. Factory Re-Manufacture gives every owner the benefit of precision facilities and knowhow that simply can't be matched in the field. You get new engine warranty, along with new engine safety and dependability—in a fraction of the time required for overhaul—and new log book with zero engine hours—all this at a modest *predetermined* price. Get in touch with your Continental distributor or write for information.

ALL CONTINENTAL AIRCRAFT ENGINE MODELS ARE AVAILABLE AS FACTORY RE-MANUFACTURED ENGINES

When buying a utility plane, choose one with all the plus values that have made Continental pilots' first choice.

Continental Motors Corporation
AIRCRAFT ENGINE DIVISION
MUSKEGON • MICHIGAN

MEN WANTED!

Can YOU Qualify?

Ask yourself! If you were standing at this desk could YOU qualify? Do you have the necessary CAA licenses to take advantage of the thousands of aviation jobs now available?

To help you prepare yourself for these opportunities, Ross Aero Publishers have compiled Aeronautical Questionnaires, based on the current CAA exams, to help you obtain the various CAA ratings or licenses needed to pave the way for an important position in aviation.

STUDY FOR CAA EXAMS AT HOME

CUT OUT AND MAIL

☐ PAYMENT ENCLOSED, SHIP POSTPAID ☐ SHIP C.O.D.

☐ Private Pilot	$5.00	☐ Aircraft Mechanic	$5.00
☐ Commercial Pilot	$5.00	☐ Flight Engineering	$5.00
☐ Instrument Pilot	$5.00	☐ Ground Instructor	$5.00
☐ Airline Trans. Pilot	$5.00	☐ Control Tower Op.	$5.00
☐ Flight Instructors	$5.00	☐ C.A.R. for Pilots	$ .50
☐ Engine Mechanic	$5.00	☐ Parachute Rigger	$5.00

NAME _____

STREET _____

CITY _____ STATE _____

NOTICE

Would you like a complete Ross Aviation Library, consisting of all 12 Ross Aeronautical Questionnaires shown here? If so, we offer the complete set at a special price of —

$15 For the price of three you can get all 12 books.

☐ Check here for this 12 book special offer.

ROSS AERO PUBLISHERS

BOX 7071-F • MUNICIPAL AIRPORT • TULSA, OKLAHOMA

CAA RATINGS in a Hurry!

CAA EXAMINERS ON STAFF

Attend a school where personalized instruction allows you to get your CAA ratings immediately.

- The largest flight school in the U. S.
- Centrally located, good weather all year.
- Free placement service.
- Largest supplier of pilots to the nations airlines.
- Only flight school in U. S. using fully automatic link trainers.
- Ground school and Flight school.
- Operates seven days a week.
- CAA examiners on staff.
- VA and CAA approved.
- Courses start every Monday, no waiting.

ROSS SCHOOL OF AVIATION

MAIL TODAY!

ROSS SCHOOL OF AVIATION
Box 7071-E, Municipal Airport, Tulsa, Oklahoma

You bet I'm interested. Without obligation, please send me information on the courses checked below:

☐ Instrument ☐ Commercial
☐ Airline Transport ☐ Flight Instructor
☐ Multi-Engine ☐ Link Instructor
☐ Executive and Business Pilot Proficiency Course

Name _____ Age _____
Address _____
City _____ Zone _____ State _____

IFR HOOD

1st in Safety! 1st in Comfort! 1st in Pilot's Choice!

The modern method of simulated instrument flight for training and maintaining proficiency. $15.00 at your Airport or

FRANCIS AVIATION
Box 299 Lansing, Mich.

mail your contribution

Cancer
% YOUR LOCAL POST OFFICE

give AMERICAN CANCER SOCIETY

THE TI-ZONE COMPUTER

Shows At A Glance
DAYLIGHT AND STANDARD TIME IN ALL U. S. ZONES

Ideal For Pilots And Travelers
Laminated Vinylite, Fits in Billfold
$1.00 postpaid
WENDELL J. DUNN
1298 Darby Rd. W. Wantagh, N. Y.

Eating—A Problem at Altitude

(Continued from page 31)

man wearing heavy gloves to remove and readjust his oxygen mask for every bite and sip. It took two hands, one more than could be spared most of the time.

The ingenuity of the air crews themselves solved this difficulty, at least partially. Ever so often, they had to let down to refuel at approximately 20,000 feet, an altitude at which oxygen masks can safely be dispensed with for a short time. Eating in relays with their masks slipped around to one side, the men had time to eat their bite-size-meals during the refueling process. Readjusting their masks a single time at relatively low altitude could be contrived, even with heavy gloves. "It's not like a steak dinner at home," Gen. Mundy says, "but the men really go for that SAC snack, as it's getting to be known."

Meanwhile, the problem of restoring lost body liquids was being met by a small, valve-like fitting in the front of the oxygen mask at mouth level. A plastic tube from a thermos flask can be inserted through the fitting without allowing oxygen to escape. This device furnished airmen enough coffee, tea, milk or water, to counteract dehydration. It also pointed toward a solution of the high altitude feeding problem—liquid diet.

According to the ideal feeding schedule, a light meal every two hours is preferable to a heavy meal every four to six hours. (The SAC snack has more than 500 calories.) The difficulty was that long-range, high-altitude bombers don't come down every two hours to refuel.

At this point, Maj. Gen. W. D. Eckert reached for his Pentagon phone and dialed a Washington number he knew well. "What our Feeding Service Section is looking for," he said when he got his connection, "is some way to drink meat and potatoes—through a straw, you know, like an ice cream soda. Got any suggestions?"

"No," came the answer, "but I know who has."

The organization Eckert dialed is probably the least known in Washington as having to do with national defense—the National Security Industrial Association. Its staff numbers less than 25, but its membership includes almost 600 companies in practically every field of industry and research, employing more than one-third of the nation's manufacturing labor force. It serves as a troubleshooter for the Department of Defense.

During Korean hostilities, for example, Navy ran into a snag on production of the Mighty Mouse, the 2.75 inch rocket, scheduled as main armament for all fighter aircraft. Two million assemblies were piled up in warehouses because of a mysterious defect that caused premature firing and threatened to blow up our own pilots and planes instead of the enemy's. Earl N. Canfield of Essex, Conn., a member of the ordnance advisory committee called on the Navy, found the defect in 48 hours, and received the highest civilian honor, the Distinguished Public Service Award.

The man to whom Gen. Eckert, NSIA

liaison officer for the Air Force, spoke over the phone was John K. Richards, a retired Commodore and association director. His culinary accomplishments have never been publicly cited, but the association's food advisory group had performed many useful tasks, such as for example, converting the old service cookbooks to a modern, card index recipe system. In a week or so, Richards had rounded up the head chefs of four of the largest meat packing companies in the country. Their problem—how to drink meat and potatoes.

Mrs. Edythe Robertson, head of the Feeding Service Section, who started her dietetic career during the last war in England and married one of her subjects, an Eighth Air Force test pilot, laid out some rigid specifications. "At high altitudes," she explained, "the only practical way for a flyer to eat is through a plastic tube. Creamed soups will have to do until we can get something better, but they need meat, potatoes and another vegetable for balanced nutriment. Fried or flatulent foods are taboo, not because of Emily Post, but because a burp can fog up an oxygen mask. Color is a factor, but otherwise, no restrictions."

Four cooks in this case proved none too many. No food such as desired existed. Since beef has the widest acceptability among meats, the researchers started with its most succulent form, filet mignon. Broiled well to draw out the natural juices, they mixed it into the gravy with mashed potatoes of a light consistency. As a second vegetable, they tried peas, but shook their heads. The mixture turned a garish green. Beets were found wanting, too. They gave the delicious brown a purplish cast. After considerable experiment, the chefs selected white asparagus as the final ingredient for the homogenized main course. It is now undergoing "field" tests ten miles above Wright Air Development Command at Dayton. When the consistency and a foolproof container have been perfected, the new goulash will be tried out on individual SAC squadrons, where the flyers themselves have the final word.

It has one drawback: you can't chew it. But Mrs. Robertson points out you can't have everything, even in goulash. A combination may eventually result, the SAC snack supplying chewing satisfaction at refueling levels, and the filet dinner its liquid energy in the stratosphere.

A major advance was scored with bananas. Tomato and citrus juices were popular and contain plenty of vitamins. Bananas were just as popular and furnish more energy, but aren't always obtainable, even in season. Moreover, the commercial variety, picked green, doesn't have as much nutriment as tree-ripened fruit. And nobody, it seemed, canned ripe bananas. Again Gen. Eckert reached for his phone and again Commodore Richards thumbed through his files. A few days later, the banana V. P. of a large fruit company turned up in the Pentagon. His company had never canned ripe bananas, but would be willing to experiment if the Air Force was interested. The delicious result, put up on Santo Domingo planta-

(Continued on page 86)

BUYING OR SELLING

AN AIRPLANE—IT PAYS TO DEAL WITH

Graubart

WORLD'S BUSIEST AIRCRAFT DEALER

Complete stock of fine personal and executive aircraft at equitable prices. We own the aircraft we sell—*deal direct and save!*

- BEECHCRAFT
- CESSNA
- PIPER
- AERO-COMMANDER
- STINSON
- NAVION

- **and all other single and multi-engine aircraft in all categories and prices.**

Financing Available

MAIL COUPON below for our new **"AIRCRAFT INVENTORY"** —bi-monthly listings, specifications and prices of our wide stock, and **"HELPFUL HINTS"** . . . valuable aids to save you money when buying a plane.

COMPLETE STOCK OF FINE NEW AND USED

AIRCRAFT RADIO AND AUTO-PILOTS

All models, new and used. Write for information on New MARK II OMNIGATOR, 12-CHANNEL SUPER-HOMER and A.D.F.-12-E. Highest trades on new radios accepted on new equipment.

Graubart AVIATION, INC.

540 N. LAKE SHORE DR. • CHICAGO 11, ILL.

Telephone MOhawk 4-6260

Graubart Aviation, Inc., 540 N. Lake Shore Dr., Chicago 11, Ill.

☐ Enclosed is $1.00 for 24 issues of "AIRCRAFT INVENTORY" and "HELPFUL HINTS."

☐ Please send immediately FREE information on a _____ aircraft. If not in stock, send specific details the moment you have one.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

ENGINE TIME . . FLIGHT TIME
to the hour and minute!

Hobbs AIRCRAFT HOUR METERS

TAKE AWAY LOG GUESSWORK

Your logs are always accurate when based on Hobbs Aircraft Hour Meters. They tell to the minute when check-ups and maintenance are due — automatically.

ENGINE HOUR METER records total engine time . . . also furnishes the information needed to determine elapsed time between oil change, lubrication, overhaul.

FLIGHT HOUR METER with Hobbs Air Switch records total flight time . . . and provides the information required to compute actual hours in the air of individual flights.

Not revolution counters — Hobbs Meters are accurate electric timing instruments designed and built for aircraft operation. Weigh only 9 ounces and do not interfere with radio reception. Easy to install . . . easy to read . . . low in price. Fully guaranteed. WRITE:

JOHN W. Hobbs CORPORATION A DIVISION OF STEWART SW WARNER
2068 YALE BLVD. SPRINGFIELD, ILLINOIS

PILOTS AND AIRCRAFT OWNERS

weatherman radio*

...brings you complete periodic CAA weather reports on low frequency range!

...just push a button for Standard Broadcast

$54.95

THE WEATHERMAN operates on both Standard Broadcast & low frequency aircraft band for leisure listening, control tower & weather sequence reception. You can save the price of $54.95 in phone calls, alone! The WEATHERMAN is light, (only 3 lbs.) 110 volt AC.-DC., needs no outside antenna & has a handy carrying handle for easy portability. Maroon & white case. $54.95 at your Airport or mail check to:

L.T.LABS-Beach & Sheridan Rd. Waukegan, Ill.

GENUINE NAVY INTERMEDIATE PILOT JACKET

Brand new, Genuine dark brown Goatskin leather with zippered front. Bi-swing back, two patch pockets, one inside snap pocket. Mouton fur collar. Celanese lined. 100% wool cuffs and waistband. The finest jacket made.

SIZES
34 to 46 **$32.50**
48 and 50 **$35.00**
State Size Wanted.

U.S.N. ISSUE

A2 ARMY FLIGHT JACKET, select dark brown goatskin leather, brown rayon lined, zippered, elastic knit waistband and cuffs, 36 to 46, **$19.75**, 48 and 50, **$21.75**.

U. S. AIRFORCE K2A FLYING SUITS, blue nylon, lightweight, 8 zippers, give chest, height and weight measurements. **$10.95**

Miracle Suede Jacket, washable, drycleanable and stain resistant. Knit nylon collar and cuffs, nylon lining. Colors available in rust, tan, and charcoal, sizes 36 to 46, **$16.95**.

Shipped ppd. if remittance accompanies order.

Distributors of tires, batteries, aircraft parts and equipment

FLYING EQUIPMENT SALES CO.
Dept. F7
1639-45 W. Wolfram St. Chicago 13, Ill.

(Continued from page 85)

tions as the fruit ripens, has been available for several months at SAC flight kitchens at home and abroad. Pilots simply check "Banana Puree" on the menu as they file their flight plans. Mixed with milk to the proper "pour point," it is delivered in a thermos flask along with oxygen and other vital equipment—quick energy at the flick of a plastic tube.

All this nutritional logistics might seem superfluous to a layman. But not to Gen. Mundy. "After we licked the indigestion problem in Korea," he explains, "we conducted tests under combat conditions to see what effect diet, not merely calories, had on a whole fighter-interceptor wing. All three squadrons of the wing, about 50 pilots, were flying F-86 jets in the same sector almost daily above 40,000 feet. Two squadrons were on a 'control' diet—whatever was available locally. The third squadron we pampered. For this third squadron, salad greens were flown from Formosa, and fresh frozen fruits and vegetables from the States. Each pilot's meals were prepared to order and served on china plates. You might guess the pampered pilots made the better record. But you probably wouldn't guess they actually destroyed or damaged twice as many enemy planes as pilots on the 'control' diet. That's exactly what happened."

Could we say that pilot diet is food for thought? END

Sulfato—Nemesis of Guatemalan Reds

(Continued from page 51)

and take off," he recalls. "Two people in the cabin were hit by commie bullets, but we escaped."

In 1950, Jerry got work in Guatemala. Willing to take any kind of a flying job, and not realizing the Communist influence infecting the Arbenz regime, Jerry took a job to do sky-writing and aerial broadcasts for Arbenz. An election was being held that year. "They promised me $20,000 for the job. I lived up to my part of the bargain but I never saw a nickel of the money," Jerry explains. "That made me mad and I got the first hint of Communist control in the Arbenz camp."

Cheated of his money, Jerry returned to the States to look for a job. His wife and children were back in Costa Rica, but he didn't think it was safe for him there. In 1952, still in the States, Jerry got a curt message from Domingo Giocolea, an ardent anti-Communist, who today is Guatemala's Undersecretary of State. "Are you interested in helping get rid of the Reds in our country?"

"You tell me what to do and I'll do it!" was the reply.

Jerry and Col. Castillo met in a neighboring Central American country. The Colonel was guarded in his talk, only telling Jerry enough to carry out his part in planning the upcoming revolution. He was to use an automobile dealership as a "front" for his activities and to give flight lessons on the side at the Guatemala City airport to permit him to perform the rest of his work. He was given the code name "Rosebinda."

"My job was to line up secret emer-

gency fields, help assemble fighter and cargo planes, recruit a group of pilots, and take aerial photographs of key targets for the day of revolution."

During the next 18 months his meetings with Castillo were frequent but secret. "I was giving flight lessons to some of the top Communists in the government so I could fly in and out of the airport without exciting suspicion."

On May 18, 1954, when the U. S. Central Intelligence Agency revealed that a secret shipment of arms had arrived at Guatemala from Russia, the situation in Guatemala City began to approach the crisis stage and the Anti-Red revolutionists were ready to move. Jerry was able to report to Castillo: "We have six F-47 Thunderbolts, three C-47 transports, a secret field from which to operate and six pilots ready to go into action."

The next thing he did was to move his wife, pregnant with their third child, and the other two children, out of the country. Ugly stories of tortures and massacres of Anti-Reds got out. Newsmen from all over the world began moving in to report on what was sure to be a major hemisphere blow-up. Jerry was sitting home alone, a few days before Castillo crossed the border into Guatemala, when his 'phone rang. "They know all about you, Jerry, get out fast!" a woman's voice said. It was the sister of Domingo Giocolea, Alcira Giocolea, who gave him the warning.

DeLarm lost no time getting to the secret air base, and the same day Castillo crossed the border, the pilot took off on his leaflet-dropping mission. The message the leaflets contained told loyal Guatemalans that the revolution had started, that there would be aerial attacks on military targets only, and to listen to the clandestine radio which would keep them informed on the progress of kicking the Red tyrants out of power.

Castillo's orders to Jerry the next day, from temporary headquarters at Esquipulas inside the Guatemalan border said, "Demonstrate over the city with the fighters but shoot only into the air."

"These were the orders of a real humanitarian," Jerry explains. "But after a couple of times the Reds thought we were poor shots. This gave them courage to come out and start shooting at us."

When Jerry finally began shooting at Red targets, Arbenz cooked up a typical Commie propaganda hoax. He announced that Jerry's .50 caliber slugs had killed a three-year-old Guatemalan girl named Hilda Leticia Torres. The Commie press all over the world picked up the story and played it for all it was worth. Even the U. S. wire service were forced to give it straight treatment, with damaging effects to the cause of the revolutionists. However, a prominent Guatemalan doctor who wanted to find out for himself about what had happened to the little girl, checked the hospital where she was supposed to have died. He learned that she was not dead, and was being treated for a minor bullet wound on her lip, caused by a spent .22 slug fired from an unknown gun.

(Continued on page 88)

WATER RESISTANT 12 HOUR CHRONOGRAPH

only **$64.95** Fed. Tax Included

Our exclusive water resistant, "12 hour" chronograph worn by more pilots throughout the world than any other watch.

NOTE THESE WONDERFUL FEATURES:

- 17 jewel movement
- Water resistant steel case
- Stop watch • 2 pushers — six hands
- 1/5 second sweep hand with time out feature
- Luminous hands and numerals • Incabloc
- 30 minute and 12 hour recorder dials
- Anti-magnetic • Unbreakable crystal

Non-Water Resistant Model, $57.50 F.T.I.

GUARANTEED! Your money back in ten days if not satisfied, for any reason. MAIL ORDERS promptly filled. Shipped post-paid for check or M.O. or will send C.O.D.

Free complete catalog of watches, chronographs and instruments with every order.

WHITE PLAINS WATCH CO., INC.
15 WEST 47th ST., NEW YORK 36, N. Y.
JUdson 6-1751

Expert repair service available on all multi-purpose watches and instruments.

Hiller research is now directed into three broad categories: helicopters, ducted fan aircraft, and tilt-wing propelloplanes.

The Army's Flying Platform

The Air Force X-18, now under construction

The Marines' XROE-1 collapsible Rotorcycle

Atomic Age Demands Preparedness...
MORE MOBILITY

Never before in history has mobility meant so much to military planning and tactics. No wonder all the services, particularly the U. S. Army, look to the air—and VTO*—for the only road to revolutionary progress.

* Vertical Take Off

Hiller Helicopters has one objective in its many research programs for the Army, Navy and Air Force: to transform ideas for better VTO aircraft, capable of widespread practical applications, from dreams to reality in the shortest time possible.

Engineers: write for opportunities with an industry leader in an ideal California locale.

HILLER HELICOPTERS
PALO ALTO, CALIFORNIA

CAA EXAM AIDS

LATEST QUESTION & ANSWER BOOKS FOR PASSING NEW CAA WRITTEN EXAMS, CHECK FLIGHTS, ETC.

EXAMS

Prepare for passing the new CAA exams with these question & answer books. These books contain the latest question & answer aids, charts, maps and a refund slip. Use these exam aids and save time, money and effort. Try them at our risk and mail the coupon today.

CAA CHECK FLIGHTS

These books clearly and simply explain how to pass the new CAA check flights. They contain the new maneuvers, new procedures, new requirements, and important information not found elsewhere. Save flying time, money, and effort. Order your check flight book today.

HOME STUDY NAVIGATION

This book clearly explains step by step how to work the E6-B computer and every basic type navigation problem. It includes the charts and complete explanations of the omni, ADF, ILS, etc. This book makes navigation problems simple and easy. Order your book today.

A & E PRACTICAL

Pass both A & E mechanic practical tests with the help of this book. It clearly explains weight & balance, welding, new requirements and experience substitutes. You also receive oral exams, demonstration jobs, and a refund slip. Try this book at our risk and mail the coupon today.

PERSONAL INSTRUCTION

Personal instruction for any CAA exam is available day or night. The methods are quick, positive and you will understand the subject. Write for details and mention your needs.

( ) Commercial Pilot Exams
( ) Commercial Check Flight
( ) Home Study Navigation Book
( ) Instrument Pilot Exams
( ) Instrument Check Flight
( ) A & E Mechanic Practical
( ) Powerplant Mechanic Exams
( ) Airframe Mechanic Exams
( ) Flight Engineer Exams
( ) Flight Instructor Exams
( ) Flight Instructor Check Flight
( ) Helicopter Instructor Exams
( ) Airline Transport Exams
( ) Airline Transport Check Flight
( ) Private Pilot Exams
( ) Private Pilot Check Flight
( ) Fundamentals of Ground Instruction Exams
( ) Engine Instructor Exams
( ) C. A. R. Instructor Exams
( ) Aircraft Instructor Exams
( ) Basic Navigation Instr. Exams
( ) Radio Navigation Instructor Exams
( ) Link Instructor Exams
( ) Meteorology Instructor Exams
( ) Tower Operator Exams
( ) Dispatcher Exams
( ) Parachute Rigger Exams

ANY 4 $10.00 ANY 2 $8.00
ANY 3 9.00 ANY 1 5.00

ACME SCHOOL of AERONAUTICS

TERMINAL BUILDING
MEACHEM AIRPORT
FORT WORTH, TEXAS
Phone MA 6-2444

☐ Payment enclosed ☐ Send COD
Please mail the items I checked above.

Name
Address
City, State

E-6B COMPUTERS

New Dalton in leather case ($10.00 value) with illustrated direction manual ($3.00 value) both $7.85. New D-4 time-distance Computers $1.00.

KANE AERO EQUIP'T
2308 N.E. 23RD. ST.
OKLAHOMA CITY, OKLAHOMA

Quality aircraft paint specialists
CAA approved repair station no. 3951
Airframe I & II, Limited airframe, Lockheed Lodestar, Powerplant I
ZELAIR
DEFIANCE, OHIO

BLIND FLYING KIT

Learn instrument flying safely and quickly by using this kit in your airplane. This kit meets Army-Navy specifications EL50303 and is approved for CAA check flights. Kit contains the new precision design optical orange panels, blue lens goggles and the famous A.S.A. book on instrument flying. Panels are attached in a few seconds to windshield and windows with special suction cups. With goggles on, you can see everything inside but not outside. Kit is light, easily stored and durable. Goggles are light, comfortable, non fogging and can be worn over eyeglasses. Price is only $49.50 and can be shipped immediately direct from manufacturer. Check off your type airplane and mail in coupon today. Be safe by being prepared.

☐ Bonanza
☐ Cessna 180 182
☐ Tri Pacer
☐ Cessna 120 140
☐ Cessna 170 172
☐ Apache
☐ Cessna 310
☐ Navion
☐ Aero Commander
☐ Cessna 190 195
☐ Beech D18
☐ Stinson
☐ Swift
☐ Luscombe
☐ Super Cub
Others not listed

AIR RESEARCH INSTITUTE
MUNICIPAL AIRPORT
FORT WORTH, TEXAS

☐ Payment enclosed ☐ Send COD
Please send kit checked at left

Name
Address
City and State

(Continued from page 87)

Nurses at the hospital had hidden the child, assuming that Arbenz would seek to kill her and hold a public funeral for its obvious propaganda value. She was returned to her mother safely after the revolution and Jerry made a point of visiting her to see for himself that the announcement of his victim was a pure fake.

From the start of the revolution the Guatemalan Army was inclined to desert and let the rebels take over. But key Reds among the officers managed to get large Army units headed for Castillo's headquarters and it was Jerry's job to halt them. This is his explanation of how he shot up the main troop train.

"I came low over this mountain and saw the long troop train moving slowly through the valley below. I was looking for it. Stopping these troops might be the key to success for our side.

"I had time to maneuver so that as I came in I was able to get bursts with my .50 caliber guns through the whole line of windows. I knew I had done damage because as I looked back I could see soldiers jumping from the moving train.

"I came around next, dove low, got the rear of the engine in my sights and let go. It was just like I had done in Japan many times. There was a small puff of smoke, and then the whole engine went up with a giant explosion.

"I made a couple more strafing runs, until everything seemed quiet down there."

It was later reported that some 150 men were killed and wounded in this action. The shock set up the Guatemalan Army for the climactic blow which Jerry was to deliver a couple of days later.

The morning of June 28th, the secret air base of the revolutionaries got the following orders from Castillo's headquarters: "There will be a reward to the pilots who can knock out the Communist radio in Guatemala City. It's jamming our radio and interfering with our communications."

There was a rush to get a full load of bombs on the fighters and take off after the Guatemala City radio.

"The first two pilots who tried radioed that they had missed but I figured it would be a snap for me," Jerry tells. Then he discovered what the difficulty was.

"As I came over the mountain and headed for the radio station, I realized that the two big towers on either side of the station were causing all the trouble. You couldn't get low enough on your run to make an accurate drop. And the mountains on the sides gave you only one approach."

He made one pass and let go with a 250-pound bomb. As he pulled up, barely missing the tops of the towers Jerry twisted around to see a geyser of dirt about 30 yards from the radio station building. "I had two bombs left," he explains, "and decided to fly over Fort Matamoros on another edge of Guatemala City for an attack there."

This decision was the luckiest he could possibly have made. Matamoros is the key defense bastion of Guatemala and nerve center of the Guatemalan army. Jerry came in low and spotted his target just

ahead. A hail of machine gun and small arms fire was directed at him from the ground and he felt his F-47 shudder a couple of times from direct hits. But he got his two bombs in the middle of the fort. "I wasn't prepared for the fantastic blast which the eggs caused," he tells. "My plane seemed to be hurled through the air and I realized that I must have hit the ammunition dump."

He had. The resultant blast killed more than 200 troops and shook the whole of Guatemala City. The psychological effect of his hit was just as great as the actual concussion. It blasted away any shred of desire the Guatemalan army retained to keep on fighting the democratic forces of Castillo. And it was accepted by the people of Guatemala as the final blow to the ambitions of the Red puppet Arbenz.

But Jerry himself was still in trouble. Smoke began pouring into his cockpit. His plane was vitally hit and he knew it. "I've been scared many times, but that moment was the worst. I knew the reputation of the Thunderbolt for exploding when it got hit in certain places and my first urge was to bail out. Then I realized what waited for me if I did. The stories of atrocities were all too true. Arbenz and his boys had dreamed up brand new tortures for freedom fighters. And what a field day they would have with me, 'Sulfato,' the one man they certainly hated most at the moment."

Jerry decided he would stay with the smoking plane until he got it across the mountain. "I could bail out there and stand a 50-50 chance of escaping into the hills," he says.

But when he got over the mountains the smoke had miraculously disappeared and, although the wheels would not come down, he made a safe belly landing back at the secret strip.

With the bombing of Matamoros, truce negotiations began and Jerry's next job was to fly Col. Castillo in and out of the tiny strip which served as rebel headquarters at Chiquimula, 100 miles east of Guatemala City. As he approached the field to pick up the Colonel one morning, he spotted a long column of soldiers moving toward Chiquimula through the woods. He circled to get a better look and decided the column had one purpose in mind. They were headed for an ambush of Castillo, the man who was about to become the new President of Guatemala. Needless to say, he ferried Castillo out of the area, frustrating the last attempt of the Reds to keep their evil hooks on Guatemala. END

1976

Sixty-five thousand privately owned aircraft are being flown today by approximately 200,000 pilots more than 10 million hours annually, according to the General Aviation Facilities Planning Group survey. By 1976 the general aviation fleet should comprise about 90,000 aircraft flying some 20 million hours each year, of which the business fleet is expected to account for 11 million hours.

WATCHFUL AS A KITTEN

TACTAIR T-3 AUTOPILOT

Nothing's so alert as a kitten stalking his prey – *except the Tactair autopilot*, sensing instantaneously the slightest change from desired flight path, making corrections so quickly and smoothly you hardly know it happened.

THE TACTAIR T-3, now in volume production and already installed on many business aircraft, is a complete new concept in autopilots. It weighs but 7.3 pounds yet gives positive 3-directional control with exclusive heading lock that flies the airplane on the exact course desired. Ideal for VOR or ILS tracking. Pneumatic operation, from the aircraft's vacuum pump, does the trick – no tubes, no electric motors, no warm-up, no power drain.

CAA APPROVED

CAA approvals now completed or pending on all leading makes of business aircraft. See your Tactair distributor or write for brochure.

TACTAIR INCORPORATED AUTOPILOT DIVISION | **AIRCRAFT PRODUCTS CO.** BRIDGEPORT PENNSYLVANIA

For 16 Years Specialists in Precision Aircraft Pneumatic and Hydraulic Controls

Say you saw it in FLYING

Official SEA, AIR & LAND PHOTOS

CARRIERS, SHIPS — NEW JETS, ROCKETS
YOUR CHOICE OF THOUSANDS

SPECIAL INTRODUCTORY OFFER — Send 25¢ with your name and address and choose one set

1. 4-3¼x5 Carrier, Subs and Battleships
2. 4-3¼x5 World War II planes
3. 4-3¼x5 photos, world's fastest jets
4. 1-8x10 photo, Forrestal Carrier
5. 1-8x10 photo USN F11F-1 Tiger Vet

OR All five sets for $1.00
Regular $2 Value

FREE With Order Large illustrated Catalog . . . PLUS — W. W. II action photos of all theaters.

MAIL YOUR ORDER TODAY

U. S. SEA & AIR PHOTOS
Dept. 2, Box 75084A, Los Angeles 5, California

AIRPLANES WANTED

FOR IMMEDIATE CASH!

Highest prices paid for clean used aircraft—Twins and Single Engines—all categories wanted. Write, Wire or Phone ALL details for immediate cash offer. No delay.

World's Busiest Aircraft Dealer

GRAUBART AVIATION, INC.
640 N. LAKE SHORE DR., CHICAGO 11, ILL.
Telephone MOHAWK 4-6260

YOU ARE TOPS IN AVIATION WHEN YOU BECOME A PARKSMAN!

YOU, as a Parks graduate, will benefit from the world-wide reputation of Parks and Parksmen as leaders in aviation!

YOU will find that your education has been so thorough . . . so complete . . . that you will be able to advance rapidly to positions of responsibility!

YOU will have earned a Bachelor of Science degree from Saint Louis University in THREE years instead of four . . . allowing you to begin your career one year earlier!

YOU WILL KNOW that no other man is better prepared to advance faster, earn more in less time . . . in America's largest industry — aviation! Find out today how YOU may become a Parksman!

You may earn a B.S. degree in Aeronautics in:

Aeronautical Engineering
Maintenance Engineering
Aeronautical Administration

(Air Force ROTC allows you to complete your education without interruption.)

Non-degree courses available — CAA Approved, A & E Mechanics — 45 weeks covering all phases aircraft and engines.

Flight courses — Private, Commercial, Instrument, Instructor and Multi-engine Ratings.

All Parks Schooling Approved for Veterans

Next enrollment date:
Sept. 5, 1957

PARKS COLLEGE, HARPER HALL
East St. Louis, Ill.
I am interested in:
- ☐ Aeronautical Administration
- ☐ Aeronautical Engineering
- ☐ Aircraft Maintenance Engineering
- ☐ Aeronautical Meteorology
- ☐ Flight Courses
- ☐ A & E Course
- ☐ Information on Public Law 550

Name..... Age.....
Address..... Zone.....
City..... State.....

PARKS COLLEGE
OF SAINT LOUIS UNIVERSITY
HARPER HALL • EAST ST. LOUIS, ILL.

THE AMAZING NEW

AN BOLT GAGE
$3.85

A precision all metal tool designed to give you the complete AN number including diameter, length, composition, and drill codes for AN aircraft bolts. Simply insert bolt in precise slot and read the exact AN number in seconds. A must for every A & E mechanic, aircraft repair shop, and bolt storage bins. Postpaid check or money order.

AN Bolt Gage Box 6313 Columbus 24, Ohio

FLYING CALENDAR

June 23—Middletown Aviation Club Tri-cathlon, Middletown (Ohio) Airport. Rain Date: June 30.

June 23—Sportsmen Pilots of Oregon Flight Clinic, Portland, Ore.

June 23—Fourth Annual Ranch Style Fly-in Breakfast. Bluffton Airport, Bluffton, Ohio. Sponsored by the Bluffton Flying Club.

June 23-25—Aviation Distributors and Manufacturers Ass'n, Twenty-ninth Meeting at The Broadmoor, Colorado Springs, Colo.

June 29—Jet Age Conference and convention of N. Y. State Wing, AFA, at the Vanderbilt Hotel New York City. Contact: Mrs. Emma Carr at the Vanderbilt.

June 29-July 1—Aero Club of British Columbia "Fishing Flight" to Tsuniah Lake Lodge. 180 mi. NW of Vancouver. Three-day package tour, $30. Write: J. Leggatt, 631 Howe St., Vancouver, B. C. Wheels or floats.

June 29, July 6—Aircraft Owners and Pilot's Association's 1957 Flight-Cruise to Bermuda and Nassau aboard luxury cruise ship, S.S. Ocean Monarch. Fares: $175-$335 per person. Contact: Lincoln Miller, Convention Manager, U. S. Travel Agency, Inc., 807 15th St., N.W., Washington, D. C.

June 30—Fly-in sponsored by the Corvallis Ch. of Sportsmen Pilots of Ore. at Corvallis (Ore.) Airport. Buffalo 'Burgers, Air Show and Boat Races.

July 2-4—World-famous Albany (Ore.), Timber Carnival sponsored by Sportsmen Pilots of Oregon.

July 2-11—Twenty-fourth Annual National Soaring Contest at Elmira, N. Y., sponsored by the Soaring Society of America. Contact: Paul Schweizer, P. O. 71, Elmira, N. Y.

July 4—Effingham Aeronautical Society Air Show, Effingham Cy. Memorial Airport, Effingham, Ill.

July 6-10—Eleventh Annual All-Woman Transcontinental Air Race from San Mateo Cy. Airport, San Carlos, Calif., to North Phila., Pa. Hosts for start of race will be Bay Cities Chapter of the Ninety-Nines, Inc., the San Mateo Cy. Development Ass'n and the San Carlos Ch. of Comm. The E. Penna. Ch. of the Ninety-Nines, Inc., and the Aero Club of Penna. are co-sponsors of the terminus of the race. For info. write AWTAR Hq., 2611 Spring St., Long Beach 6, Calif.

July 6, 7—Air Fair Days at Kearney, Neb., sponsored by American Legion Post #52.

July 7—Annual Grand Haven Dawn Patrol, sponsored by Grand Haven Aviation Club at Grand Haven Airpark, Mich.

July 9-Aug. 4—Nat'l Model Championships, Naval Air Station, Willow Grove, Pa.

July 12-14—Fly-in to Cottage Grove, Ore., sponsored by Sportsmen Pilots of Ore., featuring Square Dance, Rodeo and Buckaroo Breakfast.

July 13-15—Air cruise to West End, Grand Bahama, B.W.I., sponsored by the Florida Aero Club, Inc. Six meals, two nights lodging, taxi to and from airport, tie-down, etc., included in package for $28 per person. Write Harry B. Collins, Air Cruise Director, 375 N.E. 154th St., North Miami, Fla.

July 13-19—Fifth Annual JayCee Air Cruise from Philadelphia, Pa., to Las Vegas, Nev., sponsored by Jr. Ch. of Commerce of Phila., 121 S. Broad St., Philadelphia, Pa., G. Ralph Guthrie, Air Cruise Ch.

July 20—Fly-in Breakfast, Cascade Locks, Ore., sponsored by Sportsmen Pilots of Oregon.

July 21—Fifth Annual Fly-in Breakfast sponsored by Pottstown Unit AOPA at Pottstown Airport, Limerick, Pa. Rain date, July 28.

July 28—Strawberry Festival Fly-in, Lebanon, Ore., sponsored by Sportsmen Pilots of Oregon.

July 28—Jaycees Air Show at Portland, Ore.

July 28—Third Annual Jaycee Air Fair, Portland International Airport, Portland, Ore., sponsored by Portland Jr. Ch. of Comm.

July 29-Aug. 1—National Flying Club Ass'n, Inc. annual convention, Denver, Colo.

July 30-Aug. 2—Nat'l Flying Club Assoc. Inc., Annual Convention, Denver, Colo. Contact: B. V. Deltour, 948 E. 120th St., Hawthorne, Calif.

July 31-Aug. 4—Air Force Assn. eleventh annual convention, Washington, D. C.

Aug. 3, 4—Emerald Empire Rodeo Buckaroo Fly-in Breakfast at Eugene, Ore. featuring the northwest's largest rodeo.

Aug. 10, 11—Professional Race Pilots Ass'n Meet. Closed course midget plane races, Oshkosh, Wis.

Aug. 11—Wallowa Mountain Rescue Teams Fly-in Breakfast at Joseph, Ore.

Aug. 18—Free Fish Fry Fly-in at Pacific City, Ore. sponsored by Sportsmen Pilots of Oregon.

Aug. 30, Sept. 1—Fifth Annual Fly-in and Convention of Experimental Aircraft Assn. Curtiss Wright Airport, Milwaukee, Wis. Contact: P. H. Poberezny, 9711 W. Forest Park Dr., Hales Corners, Wis.

Aug. 31—Fourth Annual Jim Long Trophy Race from Brackett Field, LaVerne, Calif. to Phoenix, Ariz. and ret. sponsored by Pomona Valley Pilots Assn. % Brackett Field, P. O. Box 73, LaVerne, Calif.

Aug. 31-Sept. 1—Professional Race Pilots Ass'n closed course midget plane races, Fort Wayne, Ind.

Sept. 1—Salem, Ore. Annual Air Fair sponsored by Sportsmen Pilots of Oregon.

Sept. 15—Middletown Aviation Club Treasure Hunt, Middletown (Ohio) Airport. Rain Date, Sept. 22.

Calendar items must be received at FLYING's editorial offices, 366 Madison Ave., New York 77, N. Y., three months prior to the event.

YOU CAN WIN THIS 1957 CHAMPION TRI-TRAVELER

COMPLETELY EQUIPPED WITH

- Tricycle Landing Gear
- Narco Super Homer Radio
- Full Electrical System
- Shielded Ignition
- Sensitive Altimeter
- Metal Propeller
- Landing and Navigation Lights
- Wheel Pants & Prop Spinner
- 26 Gallon Fuel Tank
- Deluxe Interior

Here's how you can win the CHAMPION TRI-TRAVELER

At the bottom of the membership application is a space for you to write a statement in 25 words, or less, on "WHY I JOINED AOPA." It's simple! —just think of all the things that AOPA has done and is doing for civil aviation—just look at the list of services for AOPA members —and, you'll see many reasons why YOU joined AOPA.

The CHAMPION will be awarded to the individual submitting the best statement.

You are eligible for AOPA membership if you have soloed or own an aircraft.

Special Services Available to AOPA Members

- 12 issues of AOPA'S confidential AOPA Newsletter, mailed to you via first class mail.
- Special AOPA - Hertz Drivurself Courtesy Card and AOPA - Avis Rent - A - Car Credit Card.
- AOPA's Aeronautical Chart Subscription Service insures your flying safety by providing up-to-date charts.
- 12 issues of the AOPA Edition of Flying Magazine, or substitute.
- AOPA SAFETY SERVICE - immediate notification of CAA DIRECTIVES concerning your aircraft.
- AOPA Pilot's lapel wings and decal for automobile or aircraft.
- Handy AOPA - TWA Courtesy card provides you with help along your flight route.
- Domestic Flight Routing always available for your trips.
- Foreign Flight Routing and Washington representation to help cut your clearance and visa red-tape.
- Complete legal department to help you with your aviation legal problems.
- A $700 personal accident policy (flying only) to all active members without cost, increases $100 each year your membership remains in force until principal sum reaches $1,000
- Participation in advantageous insurance coverages available through well known aviation and life insurance companies.

AND *You will find that AOPA is always the first in fighting legislation and regulations detrimental to the welfare of private pilots . . . always first in the fight for advancement of civil aviation.*

AIRCRAFT OWNERS AND PILOTS ASSOCIATION
National Headquarters, Dept. F-77
Post Office Box 5960
Washington 14, D. C.

I would like to apply for active Membership in AOPA. Enclosed please find my check or money order in the amount of $10.00.

Name _____ Age _____

Address _____

City _____ State _____

Pilot License Number _____

Ratings _____

I first soloed an airplane at _____

Date of First Solo _____

I own aircraft, registration number _____

Make _____ Model _____

Signature _____

IMPORTANT

I UNDERSTAND THAT I AM TO RECEIVE A $700.00 AMERICO FLYING-ONLY PERSONAL ACCIDENT INSURANCE CERTIFICATE. (RESTRICTED TO THE UNITED STATES, ITS POSSESSIONS, CANADA AND MEXICO.)

_____
Name of Beneficiary

_____
Relationship

($2.00 of each year's dues are for my subscription to the AOPA Edition of FLYING, or substitute.)

I submit the following statement in the contest for the Champion Tri-Traveler: "I joined AOPA because _____

_____

_____

Reuben H. Donnelly Corporation, Chicago, Illinois, will be the sole judges in the contest and their decision will be final.

1957 PHOTOGRAPHY DIRECTORY

& BUYING GUIDE

Most Complete Handbook of Photographic products

Details on exciting new products from all over the world

SPECIAL SECTION: WHERE TO SELL YOUR PICTURES

A MONEY-MAKING GUIDE TO PHOTO MARKETS

ON SALE NOW AT NEWSSTANDS AND PHOTO STORES ONLY!

Compiled by the editors of POPULAR PHOTOGRAPHY Price $1.00

OVER 5,000 LISTINGS—1,000 ILLUSTRATED

ILLUSTRATED LISTINGS

LATEST MODELS

LATEST PRICES

PLUS: DIRECTORY OF PHOTO SCHOOLS

BIGGER, BETTER, MORE COMPLETE THAN EVER!

Cap'n Sharp Says:

"WAS YOUR COMPUTER DESIGNED FOR MERMAIDS?"

Most "old style" computers work best at sea level. But the modern Jeppesen R-2 is different. The Jeppesen computer provides correct *direct* answers from sea level to 80,000 feet, from "cub speed" to Mach 1.8.

SIMPLE • EASILY REMEMBERED

4¼" **$8.70** 6" **$11.70**

On sale at most airports. Write for folder 5L.

Jeppesen & co.

• Flight Case • Airway Manual • Air-Route Guide • Computer

STAPLETON AIRFIELD, DENVER 7, COLORADO

Port of Perfection

(Continued from page 41)

attached to a Ford tractor, and maintenance of the runways is reduced to simple mowing like a lawn. Short clippings are left on the runways to help act as a cushion. Also they help to hold moisture in the ground, eventually they rot and fertilize.

Of course, the well-mowed grass makes the field more attractive, but the real kick is in landing on it. What's it like? Like walking barefoot on a plush green carpet. Or, to paraphrase a well-known soap manufacturer—"It makes landing almost nice."

As traffic increased, Ralph became concerned about the approaches, as things he took for granted, thanks to the old railroad discard, could be definite mental hazards to the uninitiated. A house stood across the road at the end of one runway, so he bought the house and moved it, clearing that approach. Then, he contacted the power company and told them of a way he thought the power lines could be re-routed to clear another approach. The power company was dubious about his scheme, but they were willing to try. In the end the change was a success, and the company made no charge. In addition, they lowered other lines, some distance from another approach, to the point where there could be no hazard.

In the meantime, the people of Mulino were buying airplanes, and Ralph met the demand for hangars by building a quad hangar for four ships, but before the hangar was complete the space was sold out, and by the spring of 1951, when his business flying had outgrown his single engine ship, Kappler ordered a twin Bonanza and started construction of another hangar to house it. Built to his own design, the hangar is a "drive-in" affair with doors at both ends so that he taxis in one side and out the other. At the same time requests increased for more hangar space, so he added five additional T hangars, back to back, in a continuous-type building. Again the space sold out, and in 1953 there were more demands, so another string was built to house an additional nine ships. As before, it filled immediately.

This brought the total of locally owned ships to 19, and Kappler felt that was the saturation point for a community of 600 people. However, if further need develops, more hangars will be built, but as the field now exists, twenty-five acres are in two runways, and five acres are in clubhouse and hangars. The clubhouse is an attractive little building, comfortably furnished and providing phone, low-frequency radio, and rest room facilities; the hangars, neatly painted, all have full concrete slab floors, metal roofs and wood walls.

It became apparent after a while that Mulino pilots couldn't get enough flying in the daytime, and some type of field lighting was desirable, so a surplus BT lighting system operated by a time clock was installed. As this did not prove satisfactory, lights of a simple, commercial type were bought and plastic, underground cable was laid. The new system

is operated automatically by means of a light intensity switch; hence no one needs fear being caught out after dark. The cost of all-night operation of field and boundary lights averages about one-half of one hangar rent per month, about $8.

While Kappler has a penchant for profitable projects, the airport was not intended strictly as a profitable venture but rather as a hobby. He wanted to encourage Mulino people to fly so when it became evident that they wanted to learn and to buy planes, he brought a part-time instructor on the field and tried to hold costs down as much as possible so that more folk could afford training. For training ships, he bought two Aeroncas, one with 65 hp and the other with 85 hp. These are available for rental, also. No records have been kept of the number of people who have taken instruction, but Kappler says that for a small community the figure is exceptionally high.

When flying comes to a community, flying social life also comes, and Ralph Kappler's Mulino Airport is now the home of the Mulino Chapter of the Sportsman Pilots of Oregon. As a chapter it carries on a variety of flying and social functions as well as participating in a state-wide program of flying activity. One highlight of the chapter projects is an annual fly-in picnic which lasts all day at a local park and attracts well over a hundred flying folk as well as many local non-flying people. Another of the projects undertaken by Ralph and others was the construction of a lighted, free-swinging tetrahedron, visible for five miles.

Among the pilots on the field are several who are employed in Kappler's lumber business. One of them holds an instructor's rating and currently, on weekends and summer evenings, he is the instructor at the field. Also numbering among Mulino pilots is Ralph's brother, "Kip" Kappler who bases his Navion on the field.

Traffic into Kappler's field is sufficiently heavy that he now hires a man to attend the gas pumps on Sundays and in the evenings. Additionally, this man maintains the runways and does the mowing. Two gas pumps are installed so that 80/87 octane gas and a variety of oils are available. When there are more twin-engine ships on the field, as Kappler predicts there soon will be, Ralph plans to carry 100 octane fuel as well.

There is no repair service on the field, but there is an unwritten understanding among the plane owners that whenever a pilot has to take his ship to other facilities, another owner will fly along to bring him back and again to take him to pick up his ship. With this arrangement, ships are well maintained with a minimum of effort.

Courtesy, friendliness and cooperation are key words for the pilot of Mulino. They are proud of Ralph's airport, and they thoroughly enjoy being a part of it and having it as a center of community

(Continued on page 94)

65' x 17' Shell Oil Company Hangar
San Francisco Airport

MOSHER CANOPY-BIFOLD ELECTRICAL DOOR

The first economical electrically-operated hangar door designed to replace present doors without expensive remodeling; or to use in new construction for executive, commercial, municipal and private hangars. These are all-weather doors that are insulated and fit tight to defy the elements and open by folding together electrically to provide extra sun protection on apron. Operate on standard 110 volt AC current, just like your razor.

For details write:

Mosher Manufacturing Co.
421 Johnson St. NE., Minneapolis 13, Minn.
Phone: FEderal 9-4776

PILOTS — INCREASE YOUR EARNING POWER
Get Your INSTRUMENT and AIRLINE TRANSPORT RATING *NOW*

INSTRUMENT
An Instrument Rating is a MUST for all AIRLINE co-pilots, business pilots and for any one making extended cross country flights.

COMMERCIAL PILOTS COURSE
Present tremendous demand for airline pilots has depleted supply of qualified commercial pilots — if you want to fly for a living get your Commercial NOW.

AIRLINE TRANSPORT
Necessary for all airline captains — most private companies now require it for all their pilots. Single engine and multi-engine Lockheed, Aero Commander, Douglas DC-3's available.

TYPE RATING
Available to those already holding ATR's who want a Type Rating added to their license. Lockheed, Aero Commander and Douglas DC-3's available.

COMPANY PILOT REFRESHER
Single engine and Multi-engine Lockheed, Aero Commander and Douglas DC-3 aircraft available for this Course, which is tailor made for each company pilot.

MULTI-ENGINE
Lockheed, Aero Commander and Douglas DC-3's available for this course.

INSTRUCTOR
Tremendous demand for pilots holding Instructor Ratings.

A Complete Ground School Furnished With All Courses.

Train at American Flyers — the world's largest Instrument and Airline Transport Flying School — and insure your future in aviation. American Flyers has trained more pilots for the airlines than any other school in the country — MORE THAN ALL OTHER SCHOOLS COMBINED!

VETERANS — All you need to enroll in any of these courses is a Certificate of Eligibility from the Veterans Administration approving you for the courses you desire. Courses start every Monday morning — no waiting.

"THE AIRLINE PILOTS TRAINING SCHOOL"

AMERICAN FLYERS INCORPORATED

MEACHAM FIELD • FORT WORTH 6, TEXAS

MAIL THIS COUPON TODAY

☐ INSTRUMENT
☐ AIRLINE TRANSPORT
☐ COMMERCIAL
☐ TYPE RATING
☐ COMPANY PILOT
☐ MULTI-ENGINE
☐ INSTRUCTOR
☐ VETERAN ☐ CIVILIAN

REED PIGMAN, AMERICAN FLYERS,
Meacham Field, Fort Worth 6, Texas
Please send me FREE Booklet and data on courses checked —
NAME
STREET
CITY STATE

BATORI COMPUTERS

All metal precision instruments for all dead reckoning navigation. With accuracy and simplicity of operation not available in any other computer of its type.

Indicates in fixed windows ground speed, fuel consumption and drift unmistakably. Solves all wind problems without plotting, without limitation in air speed, wind speed and drift.

One moving part only, requiring one setting only. Not affected by climatic conditions. Lasts indefinitely.

Standard Type for Propeller Aircraft.
TYPE B-23, pocket size, 4" diameter; TYPE B-24, shirt-pocket size, 3" diameter. The smallest precise and clearly readable computer in existence.

Supersonic Type for Jet Aircraft.
TYPE B-26, SPEED RANGE MACH NO. 2.
Two sizes: pocket size, 4" diameter, shirt-pocket size, 3" diameter.

Vector Face

Navigational Face

STANDARD TYPE B-23
Price $15 each
including instruction booklet and leather carrying case.

BATORI PLOTTERS FOR ALL CHART WORK

- Clearly transparent, precision engraved, beveled edges, 1/16" thick.
- Unambiguous course indication.
- Replaces parallel ruler and protractor.

Mark I Scale in Statute Miles
For SEC and WAC charts
Size 11.6" x 4.3" Price: $5.00

Mark I Scale in Nautical Miles
For SEC and WAC charts
Size 11.1" x 3.8" Price: $5.00

Mark II Pocket Size, Scale in Nautical Miles
For WAC and ROUTE charts
Size 7.2" x 3.6" Price: $3.00
Complete with instruction leaflet.

Batori Computer Company, Inc.
551 Fifth Avenue
New York 17, N. Y.

PHOTO CREDITS

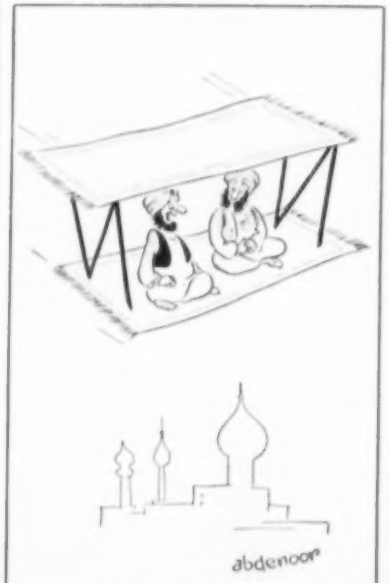
22—JEAN RAEBURN
25, 26, 27—COAST & GEODETIC SURVEY
28, 29—NANCY E. LEEBOLD
31—USAF
32, 33—AIR FORCE PHOTO
34, 35—BEECHCRAFT CORP.
36, 37—HANS GROENHOFF
39—U. S. NAVY
40, 41—LLOYD JONES AND BETH THOMAS
42, 43—THE GARRETT CORP.
46—G. KENNETH FUTRELL
47—AIR FORCE, D. C. NAT'L GUARD
52—CANADAIR, VERTOL AIRCRAFT
53—REPUBLIC AVIATION
54—DON DOWNIE
55—LINK AVIATION
56—CURTISS WRIGHT, LINK AVIATION
57—AIR FORCE
62—BLAKESLEE-LANE
82—ANKERS PHOTOGRAPHERS
98—CAA PHOTO

(Continued from page 93)

life. They'll even tell you that having those 70 acres cleared of trees and made into an attractive airport has increased their property value. You don't have to talk to many people in Mulino to understand that Ralph Kappler has given them a means of new zest and versatility in country living.

As for Oregon's Paul Bunyan of Aviation, he picked up a pretty fair sized ax when he started hacking away at flying. That young lumberman who plunked a sick Porterfield a few feet beyond a derelict locomotive little realized where flying would take him. Now he has what many regard as the finest personal airport in the entire country; he has an elaborate new two-story home—complete with an alternate office—located just at the edge of his field so that he can taxi right to the front door; he has many neighbors and associates who share his enthusiasm for flying, and in addition, by using his airplane for business, in true Paul Bunyan tradition, he has one foot planted in the Oregon woods and the other foot planted 500 air miles away in the California woods where he operates a second lumber plant. Running two businesses means a lot of flying, since he commutes between plants almost weekly except in extreme winter months. From May 1955 to May 1956, Kappler made 42 round trips in his own twin and six trips via the airlines. To date, he has over 500 hours on the twin on which he took delivery in late spring of 1954.

In the ten years since his first business trip in his Ercoupe, Ralph Kappler has continually impressed everyone with his enthusiasm for airplanes. Once started, there has been no stopping his one-man campaign to sell flying. In Oregon, he is Mr. Aviation, a friendly, indomitable fellow who put tiny Mulino on the air map and brought the Pacific Northwest flying public to his own doorstep. END



"It's a World War I model."

TWO NEW ANNUALS

FOR ELECTRONICS HOBBYISTS!
(Compiled by the editors of POPULAR ELECTRONICS)

FOR THE HI-FI FAN:

THE WORLD'S MOST COMPLETE HI-FI GUIDE!

164 pages—

9 big chapters covering tuners, tapes, changers, tone arms, needles, amplifiers, preamplifiers, loudspeakers, enclosures—and much, much more.

Plus a helpful Yearbook Section which discusses the latest trends in high fidelity . . . lists outstanding records, artists, all FM stations, Hi-Fi shows, and includes a directory of free Hi-Fi literature.

NOW ON SALE AT YOUR FAVORITE NEWSSTAND!
Price: 75¢

FOR THE EXPERIMENTER:

LEARN HOW TO BUILD DOZENS OF HANDY ELECTRONIC DEVICES!

The ELECTRONIC EXPERIMENTER'S HANDBOOK will show you, via easy-to-follow, fully illustrated instructions, how to build exciting electronic devices such as:

- Your Own Hi-Fi AM Tuner
- Thermistor Fire Alarm
- Electronic Gardening Gadgets
- A Device That Kills TV Commercials
- Electronic Toys
- Geiger Counter
- Transistorized Light Meter
- Your Own Lie Detector

NOW ON SALE EVERYWHERE!

Price: $1.00

Ziff-Davis Publishing Co.
366 Madison Avenue, New York 17, N. Y.

Have You Read?

(Continued from page 14)

late. Photo coverage of several air strikes which rendered Communist ground armies impotent, might have pointed out a few lessons. The section on airpower today is little more than a "lick and a promise."

Two years spanned the research for this book. It included screening the AF picture files and those of industry and private collections. Many rare shots were uncovered and appear here for the first time. All in all, "Air Force" adds into an informative and interesting record.

THE JET AIRCRAFT OF THE WORLD, by William Green and Roy Cross (Hanover House, $6.95) gives a comprehensive and authoritative picture coverage of jets today and the history of jet propulsion. Over 600 photos and 200 three-view silhouettes illustrate detailed descriptions of every jet and turbo-prop built and flown to date. Each craft is shown in chronological step-by-step evolution and each major type, such as the F-94-C is displayed in a series of "model" stages, in three-view silhouette, and by a full page four-view tone drawing along with a brief history.

The
JET AIRCRAFT
of the World

William Green & Roy Cross

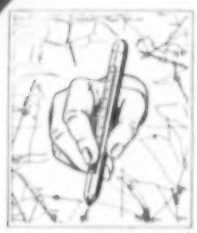
new, combination

MILE-O-GRAPH

accurately measures

NAUTICAL AND STATUTE MILES ON ALL AIR AND SEA CHARTS OR ROAD MAPS

Get mileage instantly on air charts, sea charts or road maps. No arithmetic—no special instruments! You can measure nautical miles instantly on all charts with the combination Mile-O-Graph. This precision patented combination *MILE-O-GRAPH* computes nautical and statute miles on every published air chart and sea chart of the United States and Foreign lands. Combination *MILE-O-GRAPH* also contains scales for most road maps. Saves time and temper in the air, on the sea, or on the road



ONLY
$2 EACH
OR 3 FOR $5
gift boxed

MONEY-BACK GUARANTEE.

we pay postage on prepaid orders

When ordering, please specify combination Mile-O-Graph.

MILE-O-GRAPH, INC., Dept. FL-7 • 117 Liberty St., N. Y. 6
Please send ..... combination Mile-O-Graphs at $2 each or 3 for $5. Enclosed find $ ..... or send C.O.D. I will pay postman

NAME .....
ADDRESS .....
CITY & STATE .....

Classified Advertising

NOTICE: Rates, 40¢ per word. Minimum 10 words. September issue closes July 3rd. Send order and remittance to FLYING, 366 Madison Ave., N. Y. City 17

AIRPLANES FOR SALE

AERO COMMANDERS

16 FROM $33,500. Late 520, #FQTXBF, has 180 hours SMOH. Three-bladed propellers. Double windows. Fine radio. Beautiful. $39,500 including financing. Make offer. Also: December 1954, 560, #XPTFBF, with zero SMOH. Exceptional radio. Oxygen. Beacon. Extras. Best condition. $59,300. Powers & George, 475 Fifth Avenue, New York 17, N. Y.

BELLANCA

CRUISAIRS: 9 available. 1947, #JFXZZF, has 354 hours SMOH. Aeromatic. Small fins. Gyro. Radio. Good fabric. Reupholstered. Repainted. New glass. Clean. $3200. Also: 1946, #ZPZFXF, with zero SMOH. Recovered, repainted 1956. New tires, glass. Gyro. Omnirange. Relicensed. Exceptional. $4500. Powers & George, 475 Fifth Avenue, New York, N. Y.

BEECH

BONANZAS: 30 from $7150. 1951, C-35, #RZQJCF, has 390 hours SMOH. Gyros. Lear VHF transceiver. Omniqator. ADF. Extras. Repainted 1956. Undamaged. $9525. Also: 1954, E-35, #JGFZBF, with 355 hours. Auto-pitch control propeller. Gyros. Omnirange. ADF. Bargain. $12,990. Powers & George, 475 Fifth Avenue, New York 17, N. Y.

C-D-E-18S TWINS: Large selection from $14,000. C18S, #PQQSXF, has 110 hours, SMOH. Dual panel, omnirange, and ADF. Anti-icing. Best executive condition. Bargain. $16,300. Also: 1946, D18S, #ZSSGQF, with 100 hours SMOH. Excellent radio. Auto-pilot. Clean. Relicensed. $30,000. Powers & George, 475 Fifth Avenue New York 17, N. Y.

CESSNA

CESSNA 180 late 55 full panel, including Omni and artificial horizon with 390 hours. Always hangared perfect condition. Write or phone Stenersen Mahogany Corporation, Cockeysville Maryland, phone 111.

172's: 10 AVAILABLE. 1956, #RSZJAF, has 290 hours. Primary blind. LF. Omnirange. Like new. $7500. Powers & George, 475 Fifth Avenue New York 17, N. Y.

180 AMPHIBIANS: 3 available. 1955, #GXFGDF has 200 hours. Factory corrosion proofed. Lifting rings. Stainless cables. Full blind. LF. Omniqator. Repainted, relicensed May 1957. Beautiful. $16,825. Powers & George, 475 Fifth Avenue, New York 17, N. Y.

182's: 4 AVAILABLE. Painted 1956, #PGPJAF, has 210 hours. Gyros. Omniqator. Heated pitot. Shoulder harnesses. Engine-driven vacuum. Extras. Cost $16,675. Asking $12,500. Make offer. Powers & George, 475 Fifth Avenue, New York 17, N. Y.

310 TWINS: 9 Available. 1955, #FZJTBF, has 310 hours. 40 SMOH, repainted 1957. Beacon. Oxygen. Omnirange, ADF, complete auto-pilot, other radio cost $17,000. Aircraft equipped cost $74,000. Bargain. $42,900 delivered. Make offer. Powers & George, 475 Fifth Avenue, New York 17, N. Y.

HELICOPTERS

HOMEBUILT Helicopter Handbook. Explanations: Components; Rotors; Airfoils; Design. $1.00. Son Urshan, Box 4332 N.P. Sta., San Diego 4, Calif.

HILLIO

COURIERS: 2 from $18,000. 1954, #FQSPDF, has 230 hours. Gyros. 27 channel Simplexer VHF transceiver. Omniqator. Undamaged. Like new. $21,750. Powers & George, 475 Fifth Avenue, New York 17, N. Y.

NAVION

32 AVAILABLE. 1948, #FRGGK, has 70 hours SMOH. Gyros. LF. Omnirange. Heater. Clean. $6000. Also: 225's from $8125. Also: 1951, 260HP, #RQPXKF, with 335 hour remanufactured engine. Gyros. LF. VHF. ADF. Relicensed. Clean. $8700. Also: six Twin Navions. Powers & George, 475 Fifth Avenue, New York 17, N.Y.

PIPER

1955 SUPER Custom Tri-Pacer. Red and cream color. Gyros. Omni, Low Freq. New License. Like New. Bargain $5500. Willard Sanders, c/o Valley Motel, Pauls Valley, Okla.

APACHE Twins: 18 available. 1955, #QQPPPF, has 440 hours. Auxiliary tanks. Extras. Clean. $25,950. Also: late 1956, #XSTRPF, with 140 hours. Auxiliary tanks. Extras. Like new. $34,000. Powers & George, 475 Fifth Avenue, New York 17, N. Y.

ROYAL GULL

JULY 1956 amphibian, #FSSXFF, has 130 hours. Full feathering three-bladed propellers. Gyros. Simplexer. Omniqator. ADF-12. Extras. Late improvements. Like new. Cost $80,000. Asking $70,000. Powers & George, 475 Fifth Avenue, New York 17, N. Y.

AIRPLANES MISCELLANEOUS

$2.00 CAN save you hundreds. It's New! Now you can receive information each month on hundreds of aircraft for sale throughout the United States. At a glance you will know what is available, hours, date licensed, price, etc., of practically every type of airplane manufactured. We tell you who owns the aircraft and you deal direct, saving time, eliminating hours of travel, and by knowing the market you get the best deal possible. You can receive your first copy listing aircraft for sale immediately. Don't wait! Send $2.00 Today for a full year's subscription. Flyers' Market, published by Aircraft Listing Bureau, 5305 Congress Street, Chicago 16, Ill.

$2.00 WILL bring you our circular of hundreds of Airplanes For Sale throughout the United States, that we have listed, also we will finance and insure your deal, send today. Clarke Airplane Sales, Box 62, Davison, Michigan.

25 AIRPLANES for sale or trade: Everything from Cubs to twin Beeches, in exceptionally good condition. Our planes are noted for their excellent quality. We will buy, sell or trade. Write for our complete list, no obligation. We'll deliver anywhere in the U.S.A. $50.00 will bring the aircraft of your choice to the airport nearest you for your personal inspection. Call, write or wire now. Combs Aircraft, Inc., Stapleton Airfield, Dept. F, Denver 7, Colorado. Ph. DUdley 8-2471.

AIRCRAFT WANTED

WE have hundreds of buyers, for good clean Airplanes in all categories, please list your plane with us for fast service. Clarke Airplane Sales, Box 62, Davison, Michigan.

EXCELLENT Used Aircraft Any Category. Call—Write—Wire details and Lowest Price for Immediate Cash. Graubart Aviation, Inc., 540 N. Lake Shore Dr., Chicago 11, Ill. MOhawk 4-6260.

OFFER your aircraft for sale world-wide. Hundreds sold from $3000 through America's first Aircraft Brokers, Powers & George, 475 Fifth Avenue, New York 17, N. Y.

PARTS AND ACCESSORIES

McCAULEY Met-l-prop Special Trade in offer, try before you buy, no obligation. Write for list of used wood props. Luther Parts, Johnstown Airport, Johnstown, Pa.

TRY a McCauley Met-l-prop on your Swift. Money back if performance not increased. Luther Parts, Johnstown Airport, Johnstown, Pa.

LARGEST stock in the U. S., of New, Used, and Overhauled engines, propellers, accessories and airframe parts. Free lists by makes. Univair, Dept. D, Box 5306, Denver, Colo.

AVIATION EQUIPMENT

NEW 1955 "Mark VIII-C improved Dead Reckoning Computer with instructions, pocket size only $2.50"; New E-11 pocket size high speed, high Altitude Computer $5.00; New "Airlines Computer" (successor to American Airlines Computer), $8.00; "Batori Pilot's all metal Computer" $15.00; Pressure Pattern Drift, $2.50; Pressure Pattern Plotter, $3.00; New E-6B, $10.00; Warner Computer, $6.00; "Jeppeson R2 Computer," $6.70. Free Catalogue. Pan American Navigation Service, 12021-8 Ventura Blvd., N. Hollywood, Calif.

HEADSETS, new Hi-Fi dynamic headsets, large sponge rubber earcups, $12.50. Extension cord $1.25. Telex twin sets, with extension cord, CAA approved, weight 1.6 oz. $10.95—with volume control $14.04, including plastic carrying case. Shipped postpaid if remittance accompanies order. Flying Equipment Sales Co., 1641-5 W. Wolfram St., Dept. F7, Chicago 13, Illinois.

FREE catalog describing famous Weems navigation aids and instruments. Send today. Weems Mark II Plotter (statute miles) $2.00; Weems Mark II N Plotter (nautical miles) $2.50; Dalton E-6B Computer $10.00; new Mark VIII-C Computer $2.50; new Casey-Myers Computer $4.00; Link Bubble Sextant $37.50; many navigation books including new Weems Air Navigation $6.00; Flying the Omnirange, Zweng $4.00; Electronic Navigation, Orman $4.50; Learning to Navigate, Weems and Eberle $2.00; Star Chart, Illyne $1.00. Do as other navigators, pilots and students do. Select your navigation aids and instruments from the Weems Catalog. Send for it today. Address Department 12, Weems System of Navigation, Annapolis, Maryland.

E-6B COMPUTERS New ($10.00 value) in leather case with direction manual ($3.00 value) containing 70 illustrations and 200 practice problems both $7.85. Weems Mark II Plotters new $2.00. D-4 time-distance Computers new $1.00. Kane Aero Equipment Co., 2308 N.E. 23rd St., Oklahoma City, Okla.

SPECIAL! BC-1206 Range Receiver 195-420KC. 24V. D.C. $9.95. With 110V. A.C. Power Supply $23.00. Texas Range Receiver Co., Rt. 1, Box 221B, Grand Prairie, Texas.

MICROPHONE, new, T38E, with coiled cord, mounting bracket, rubber cap (small round navy mike with push button on top), $9.95. Shipped postpaid if remittance accompanies order. Flying Equipment Sales Co., 1641-5 W. Wolfram St., Dept. F-7, Chicago 13, Ill.

HELMETS, new A-11, Dark Brown Kidskin, large navy earcups, $3.45. ANH same as above, except made of byrdcloth, $2.00 each. Headsets for above helmets, $3.95. Shipped postpaid if remittance accompanies order. Flying Equipment Sales Co., 1641-5 Wolfram St., Dept. F7, Chicago 13, Ill.

BUY Surplus Aircrafts; Fuselages; Assemblies; Aircraft Engines; Instruments; Electronics; Radiotelephones—Buy Direct from U. S. Government Depots—List & Procedure $1.00—Brody, Box 8-BU, Sunnyside 4, New York.

CHARTS AND MAPS

WORLD coverage of all current aeronautical maps and charts. Agents for Coast & Geodetic Survey, Hydrographic Office, Air Force. Free catalogue available. Pan American Navigation Service, 12021-8 Ventura Blvd., N. Hollywood, Calif.

LOG BOOKS

STEELE'S Pilot Log $1.50; Pilot Flight Record Log $1.00; Senior Pilot Log $5.70; Airline Pilot Log $5.70; Air Stewardess Log $2.00; Air Navigator Log $2.00; Flight Engineer Log $2.00; Aircraft Log $1.50; Engine Log $.70; Pilot Progress Rating Log $1.00 (Free catalog.) Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

PHOTO

PHOTOS of Aircraft. 52-page catalog, 50c. Lists nearly 6,000 photos from Wright biplane to latest jet. Old Aviation Books. 36-page catalog, 25c. Over 15,000 in stock, including World War I. Aircraft Drawings in Color. W.W. I. And II Aircraft, 11x8½, super-detailed. Send $1.00 bill for photo catalogue, book catalog, sample photos, and list of drawings. Aeroplane Photo Supply, Box 195, Toronto, Canada.

METAL CONVERSIONS

CHECK these advantages of All-Metal: Time-proven, durable Aluminum Alclad, Riveted construction—no screws or rib stitching. More rigid, stronger, smoother. No more fabric headaches or 100% depreciation. Increased value, better appearance. No kits, only complete conversions offered. Check these installed f.a.f. prices: Ercoupe-new, thicker leading edge, 2 hour exchange $350. Cessna 120-140 4 hour exchange $395. Stinson-108, wings 1 day exchange $595, fuselage 1 week $695, both 1 week $1195. Our custom quality and production methods developed from hundreds of conversions give you the best for less. Ask any owner of a Skycraft conversion. Order now, Skycraft Design, Old Star Airport, Langhorne, Penna. Windsor 3-7750.

AVIATION BOOKS

WARNING—CAA examination is being changed: It takes more than questionnaires to prepare you for the new "open-book" CAA examinations. You need the text and background material that only the authoritative, up-to-date Zweng Manuals provide. Used by aviation schools throughout the world. Fully illustrated, each manual averages more than 300 pages, with latest examination, too. There's a proven Zweng Manual for each rating: "Helicopter Rating" (new edition), $5.00; "Commercial & Private Pilot Ratings," both for $4.00; "Instrument Rating," $5.00; "Airline Transport Pilot," $5.50; "Flight Instructor," $5.00; "Flight Engineer," $5.00; "Aircraft Dispatcher," $5.00; "Link Instructor," $4.00; "Parachute Technician," $3.00; "Aircraft & Engine Mechanics," (including hydraulics, weight & balance) and new "Electrical Examination," $5.00; Meteorology for Airmen with examination (Zweng), $3.00; "Manual of the E-6B Computer," $3.00; "Rules of the Air," indexed, illustrated, $2.00; "Ground Instructor, Basic," $2.75; and "Ground Instructor Rating, including examinations," $4.00, prepares you; "Flying the Omnirange," $4.00; "Encyclopedic Aviation Dictionary," $6.00; "Electronic Navigation, radar and loran" (Orman), $4.50; "Air Navigation," 1955 Gold Medal Edition (Weems) prepares for Navigator Rating, $6.00. We supply any book by other publishers, including: "Jet Aircraft Power Systems," $6.50; "Radio Operator's License," $6.60; Practical "Air Navigation" (Lyon) $3.00; "Stick and Rudder" (Langewiesche), $5.50; "Crop Dusting" (6 manuals), $12.50; "Airline Piloting," $3.00; "Flight Manual for Aviation Cadets" (Hoyt), $2.00; (Free Catalog), Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

BRAND new "Private Pilot Examination Guide" covering new test. Only $1.25. New Civil Air Regulations covering latest Part 20 and all late amendments with practice quiz and supplementary data. Only $1.25. "Your Instrument Rating" covering latest test complete with briefings and sample problems worked out. Only $5.00 postpaid or C.O.D. Merrell Aviation, Box 6, Boeing Field, Seattle, Washington.

USED aviation books and magazines. Free list. Len Morgan, 3058 Newcastle Drive, Dallas 20, Texas.

PRACTICAL amateur lightplane design plans, photographs, $4.75. Brochure, 10¢. Wm. Fike, Box 683, Anchorage, Alaska.

INSTRUCTION

OPERATORS, Instructors, Schools: prepare your students for the top—with Zweng Manuals. Complete Texts, latest typical examinations. Free catalogue. Aeronautical and Marine discount sheet. Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

LEARN to Fly. Qualify for Flying Cadet, Officer Candidate or Specialist Training in armed forces technical schools. Get paid while learning. Prepare quickly for qualifying examinations. Guaranteed "Practice Tests" with answers: Flight Aptitude, $3.25; General Educational Aptitude, $3.25; College and High School Equivalence tests, $5.00. All three sets, $8.75, prepaid. Cramwel Books, FL-7, Adams, Mass.

LEARN Another Language At Home with Linguaphone. The World's Standard Conversational Method, on life-like, conversational recordings. You learn to speak French, Spanish, German, Japanese, Modern Greek—any of 34 modern languages easily, quickly, naturally. It's like living in another country. Complete language courses available for Free Trial. Send for Free Book and Details of Free Trial. No obligation. Linguaphone Institute, T-128-077 Radio City, N. Y. 20.

BUSINESS OPPORTUNITIES

AVIATION Operators: Many operators are increasing their income by stocking Zweng texts and general aviation supplies. Apply for a Dealership now. Pan American Navigation Service, 12021 Ventura Blvd., N. Hollywood, Calif. (Free Catalog.)

$200 MONTHLY Possible, Sewing Babywear! No house selling! Send stamped, addressed envelope. Babygay, Warsaw 77, Indiana.

AVIATION Jobs—Names and Addresses Of Companies To Contact. $1.00. Fitzgerald. (Chicago Division), Dept. A-1, 815 Countryside Drive, Wheaton, Illinois.

START your own aviation business with little capital. 47 opportunities. Details free. Christopher Publications, Holtsville 1, N. Y.

MAKE Money with aviation. Up to $400 in one day. Send $2.00 today for secrets of money making methods. Aero Advertising, Dept. 7, 3030 W. Pierce St., Milwaukee 15, Wisconsin.

PATENTS

INVENTORS. When you are satisfied that you have invented something of value, write me without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers, Registered Patent Attorney, 912 Columbian Bldg., Washington 1, D. C.

INVENTORS. Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 218 Columbian Bldg., Washington 1, D. C.

SITUATIONS WANTED

NEED Co-Pilot for Summer Months? 2000 hrs., Light to c-54 experience Comm., Instrument Ratings 1956 Graduate USAF Instrument Pilot Instructor School. Not employed by Aviation firm. Classified Box 103, c/o FLYING, 366 Madison Ave., New York 17, N. Y.

GERMAN, 26, 1 yr. college, 1 yr. Canada, fond of aviation, Private License, wants aviation contract with any company crediting his Commercial to deduct from later wages. Please connect Wolfgang Domagk, Lethbridge Flying Club, Lethbridge 272, Alta, Canada.

GRADUATE Mechanical Engineer, Private Pilots License, Plenty of nerve desires job flying. Contact Bob Vermillion, 215 South Riverside Dr., Cocoa, Fla.

ARMY Helicopter Pilot. 200 Hours Hillers And Bells. 500 Hours Light Plane. College Graduate. Prefer Helicopters. Classified Box 104, c/o FLYING, 366 Madison Avenue, New York 17, N. Y.

PUBLIC relations and/or historical research with aviation establishment. College graduate. Excellent background. Write to: Francis J. Caffrey, 508 Oneida Street, Fulton, New York.

HELP WANTED

QUALIFY for better employment opportunities with an Educational Equivalency Degree by comprehensive examination, based on past education and experience. Free details. Cramwell Research Institute, FM-7, Adams, Mass.

AVIATION Jobs—Names And Addresses of Companies To Contact, $1.00. Fitzgerald, (Chicago Division), Dept. A-13, 815 Countryside Drive, Wheaton, Illinois.

CONFIDENTIAL Reports on best paying opportunities in foreign and domestic employment for skilled and unskilled. Aviation, construction, government, oil, shipping, laborers, office-work, trades, factory, supervisory, unusual jobs of many types. Special reports for pilots, engineers, mechanics, all aviation specialists with Airlines, Feederlines, Aircraft Factories, Cropdusters, Corporation Aircraft, etc. One year registration—advisory service. Five reports included Absolutely Free: (1) Alaskan Opportunities; (2) Spanish-Airbase; (3) South America; (4) Husband-wife Foreign Opportunities; (5) Employment Abroad Facts. Satisfaction Guaranteed or Double your money back. All for only $2.00 ($2.35 Airmail) Research Services, Suite 206-FM, Brown Building, St. Louis 5, Missouri.

CO-PILOTS—Airlines Hiring But You Need More Than Ratings—Airlines Gives Applicants Tests—Prepare—Study Airline Co-Pilot Practice Tests—$3.00—Contains Type Tests Given By All Major Airlines To Co-Pilot Applicants—Aviation Knowledge, Mechanical Aptitude—I.Q. Prepare—Don't Go In Cold. Airline Co-Pilot Practice Tests—$3.00. Other Esxco Publications: Flying Clubs Do Pay Off—$1.00. ROTC Contract Flying School Booklet—$1.00. Aviation Job Lists (Directory, Airlines, Operators, Companies Employing Pilots)—$2.00. Private, Commercial, Instrument Rating Home Study Courses—$2.50—$4.50—$5.50. Esxco, 1654 Idlewood Ave., Akron 13, O.

WANTED: Flight Instructor. Will be required to instruct ground school, fly charter, and help operate airport. Send qualifications and salary desired. Crest Aviation, Box No. 1, Laramie, Wyoming.

HIGH-PAYING Jobs Now Open! We will rush latest confidential reports on best employment opportunities (foreign, domestic, skilled, unskilled). Hundreds of aviation jobs now available! Also, jobs in electronics, construction, shipping, oil, and other lines. Application forms. Free registration. One-year advisory service. All for $2.50 ($2.85 Airmail). Unconditional Money-back Guarantee. Aviation Employment Information Service, Holtsville 7, New York. Six reports included Absolutely Free: (1) Pilot's Business Flying Directory; (2) Helicopter Opportunities; (3) Government Foreign Service; (4) Directory of Companies with Foreign Branches; (5) Alaskan Opportunities; (6) Directory of Airlines and Aircraft Manufacturers.

AVIATION Employment information. Names, addresses, applications, etc. Guaranteed Reports only $1.00. Aviation Division, Suite 207, 8008 Carondelet, St. Louis 5, Missouri.

OVERSEAS and stateside employment leads. Now hiring for aviation, construction, shipping, truckdrivers, laborers, mechanics, salesmen, clerks, many types work. Skilled and unskilled to $1500.00 monthly possible with overtime and transportation. Guaranteed Reports $2.00. Travel-jobs, Dept. 207-H, 101 So. Meramec, St. Louis 5, Missouri.

MISCELLANEOUS

HOMEBUILT Designer-Builder Handbook. Formulas; Layout; Airfoils; Engines. $1.00 San Urshan, Box 4332 N.P. Sta., San Diego 4, Calif.

AVIATION Photo & Book Collectors! New lists of photos & books now available. Including Pioneer, WWI & II. Exclusive photos of Historical planes, latest Jets. Send 25¢ for sample photo & book lists. Airbooks, P. O. Box 958, New Rochelle, N. Y.

AIRPLANE photographs, beautiful large 14x17 color reproductions. Decorate dens, etc., with war planes in action. Six assorted. Send $1.00. Jarvis, Box 126 F, Bostonia, Cal.

PHOTOS—Republic Aviations Newly Released Photo Of The F-105 "Thunderchief" 11 x 14 Print For Framing Plus Catalog $1.00. Republic F-105 35mm Transparency 40¢ Plus Catalog. Harry McIntyre, Box 423, Ocean City, New Jersey.

DON'T junk your G.E. AS-1-B low freqency radio, let us convert it to a powerful V.H.F. fully guaranteed. Center Electronics, 867 Broad St., Central Falls, R. I.

FLIGHT Forms, simple but effective means of planning and recording your flight. Knee board size. $1.00 per pad; 3 for $2.00. Donald Conover, 215 Grove St., Somerville, N. J.

NEW 7 inch plastic scale model mounted on wood base with glass ash tray inset. Piper Apache, Aero Commander, Cessna 310, Boeing 707. $1.00 each. Also 10 inch model of Beechcraft Super 18 for only $1.49. Donald L. Miller, 2257 Hemphill, Ft. Worth, Texas.

FREE "Retirement . . . $68,700.00 Investor's Dream!" Zinke, 315-L Lincoln, Mount Morris, Illinois.

ADVERTISERS INDEX JULY 1957

A. C. Spark Plug 9
Acme School of Aeronautics 88
Adams Aircraft Sales Inc., Jack 73
Aero Design & Engineering Co. ..... Third Cover
Aeronautical University 66
Aeroquip Corporation 75
Air Associates Inc. 81
Air Research Institute 88
Aircraft Owners & Pilots Assn. 91
Aircraft Radio Corporation 61
Aircraft Specialty Lines 79
Airtex Products 14
American Airlines 21
American Flyers 93
An Bolt Gage 90
Aviation Photo Exchange 80

Batori Computer Company, Inc. 94
Beech Aircraft Corporation 68, 69

Cessna Aircraft Co. 12
Champion Spark Plug Co. 15, 16, 17, 18
Colonial Aircraft Corp. 73
Convair ..... Fourth Cover
Continental Motors Corp. 83

Dunn, Wendell J. 84

Embry-Riddle Aeronautical Institute 19
Esso Standard Oil Co. 59

Flite-Tronics, Inc. 74
Flying Equipment Sales Co. 86
Flynn, Dr. John T. 64
Francis Aviation 94

Garrett Corporation, The 24
Glasco-Air 78
Globe Industries, Inc. 7
Goodyear Aviation Products 3
Graubart Aviation, Inc. 85, 94

Hi-Fi and Experimenters Handbook 94
Hiller Helicopters 87
Hobbs Corp., John W. 86

Indiana Technical College 70

Jeppesen & Co. 92

Kane Aero Equipment Co. 88

Lake Television Laboratory 86
Line Material Co. 8
Lubri-Loy Co., The 66

Meyer's Aircraft Company 76
Mile-O-Graph Inc. 95
Mosher Mfg. Co. 93

National Aeronautical Corp. 65
Northrop Aeronautical Institute 77
Nova-Tech, Inc. 67

Palley Supply Co. 80
Pan American Navigation Service 64
Parks College 90
Photography Directory 92
Pilots Employment Agency 76
Piper Aircraft Corporation 23
Pitt, John E. 66
Professional Associates, Administrators 80
Puritan Compressed Gas Corp. 63
Pye Corp. of America 72

Republic Aviation Corp. 13
Ross Aero Publishers 72, 84
Ruleto Industries, Inc. 6

Scott Aviation Corp. ..... Second Cover
Shannon Airport 70
Skycraft Design 70
Socony-Mobil Oil Corp., Inc. 11
Southwest Airmotive Co. 71
Spartan School of Aeronautics 79
Standard Oil Company of California 5
Survival Equipment Co. 74

Tactair, Inc. 89
Trecker Aircraft Corporation 70

U.S. Sea & Air Photos 89
United Air Lines Inc. 62

Warner Instrument & Sales Co. 72
Weems System of Navigation 63, 78
White Plains Watch Co. Inc. 87

Zahns Airport 76
Zelair Corp. 88
Zep Aero & Oxygen Equipment Co. 64

Briefings . . .

(Continued from page 10)

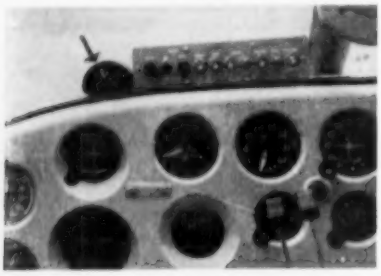
esting operation with headquarters in Rosario, Argentina—some 150 miles northwest of Buenos Aires. The new line will make eight to ten flights daily transporting passengers and cargo from Rosario to Buenos Aires via Montevideo, Mar Del Plata, Bahia Blanca, Mendoza, Cordoba, Tucuman and Resistencia. The round-trip fare between Rosario and BA is quoted at $11.25 U. S. money.

GETTING READY for commercial jet transportation, CAA inspectors and flight test engineers are receiving jet training at CAA's Aeronautical Center in Oklahoma City, in an F-80C on loan from the Air Force. Two who recently completed the first two-week refresher course were

W. B. Barclay, General Operations Specialist, and Gordon Becker, Air Carrier Operations Specialist. D. L. Baker supervised instruction and George Masterson was the instructor. (L to R) W. B. Barclay, D. L. Baker, Geo. N. Masterson and Gordon Becker.

MISSOURI'S State directory of airports and personal use strips, only recently updated, is now available. Personal copies will be mailed to all aircraft owners in the State and to others upon request.

REDESIGNED TO IMPROVE the instrument's location in the cockpit, the Safe Flight Speed Control Indicator is shown here in a typical mounting in a C50 Twin Bonanza. Presented by the pointer is a continuous reading of the plane's lift con-



dition at lower speeds, information vital to the pilot for an ideal approach to the runway with maximum safety. The instrument also provides an immediate indication of the best single-engine climb speed for multi-engine aircraft.

PIPER AIRCRAFT chalked up a company record in March when its orders for planes and spare parts for the month reached $3,012,312. With $237,772 accounting for spare parts, the score included delivery of 49 twin-engine Apaches; 127 Tri-Pacers; 52 PA-18 Agricultural planes and 45 2-place Piper Super Cubs. Timed with this announcement was a 6-months gross sale report of $14,455,816, a 22 per cent sales increase and profits increase of 45 per cent.

LLOYD AVIATION of Des Moines, Iowa has been named new distributor for Cessna Aircraft in 73 of the state's 99 counties. A new corporation set up after purchase of the assets of American Aviation, the firm has three established dealers: Hunter Flying Service of Cedar Rapids, Dwyer Flying Service of Charles City and Breazeale's Flying Service of Mt. Pleasant. Other dealers are being sought for Mason City, Ft. Dodge, Waterloo, Ottumwa and Marshalltown.

BACK AT BASE after breaking the sound barrier in a two-place North American F-100F Super Saber shown in background, Lt. Gen. Thomas S. Power, Commanding General of the ARDC, congratulates his fellow flying officer, Brig.

Gen. J. S. Holtner, commander of the Flight Test Center at Edwards Air Force Base for the smoothness of their sound breaking flight. A triple-threat plane, the F-100F can serve as a fighter-bomber, observation plane or trainer.

VOLUNTEER AIR CREWS of CAP flew 12,321 hours in 1956 on air search, rescue and mercy missions. Equivalent to flying 49 times around the world, CAP's 1956 flying hours comprise 77 per cent of the total hours flown by all other participating agencies. (Air Rescue, Army, Navy, USAF, Coast Guard and private agencies.) Total hours flown by all agencies amounted to 15,797. Of these, Air Rescue flew 1,510; others 1,966 hours.

CESSNA AIRCRAFT sales for the period covering January through March totaled a healthy $17,233,000 as compared with $15,004,000 for the first quarter of the 1957 fiscal year. Profits after taxes for the second quarter were $852,300 and represent an increase of $1.12 per stock share over $1.09 for the previous quarter. Increasing deliveries of the T-37 twin-jet trainer and other military products were primarily responsible for the sales gain.

WITH THE ASSISTANCE and cooperation of Standard, Gulf and Shell Oil companies, 30 new wind socks are flying on 27 Alabama airports.

PATTERNED AFTER THE CAA scenario type test for instrument pilots, Ross School of Aviation, Tulsa, Okla., has prepared an Examination Guide which takes the pilot on a simulated X-country using Omni, low frequency and ADF. Much stress is placed on preflight planning and extensive weather briefings are included in the

guide as well as parts of the Airman's Guide, Flight Information Manual, Radio and Approach charts. Revised also is Ross's ATR Guide. Each book $5. The school distributes free, upon request, the 1957 version of CAA's Instrument Pilot's Shorthand Dictionary.

RECENT DEVELOPMENT of Transval Engineering, Culver City, Calif., is the TCA-10, a 10 watt cabin amplifier, completely transistorized, weighing less than 3.25 pounds. The unit uses printed circuitry and operates, without power supply, directly from the aircraft primary source.

IN PRODUCTION at National Aeronautical Corp., Ft. Washington, Pa., is the new Narco VTA-3 VHF Transmitter with 27 channel capacity. Lightweight (20 ozs.) the VTA-3 is available with transmitter tuned for low-band (118 to 123 mc) or high-band (121.5 to

126.9 mc). It can be used with its own power supply as an independent unit or attached to the Narco Omnigator, Simplexer or LFR-3, LF receiver. Price with two crystals is $132, plus choice of power supply at $90 or $150.

GUARDING one of six Grumman S2F Trackers in Naples, Italy, are two members of Italy's colorful Carabinieri Honor Guard. The six anti-submarine airplanes were awarded the Italian Gov-

ernment under the Mutual Defense Assistance Program. The Tracker is used extensively by the U. S. Navy in submarine control.

IN LIGHT OF THE FACT that instrument flight clearances are kept for 30 days in towers and centers, CAA recommends that copies of these clearances be kept by the individual for a minimum of 30 days in case of question or investigation into an alleged violation.

PRINTED IN U.S.A.

what's your ACIQ ?*

	560-E	680-Super
High Speed, rated power—10,000 ft.	222 mph	260 mph
Cruising Speed, 70%—10,000 ft.	210 mph	230 mph
Stall Speed, gear and flaps down, power off	66 mph	71 mph
Take-off Distance to clear 50-ft. obstacle at S/L	1,452 ft.	1,540 ft.
Landing Distance to clear 50-ft. obstacle at S/L	1,500 ft.	1,625 ft.
Gross Weight	6,500 lbs.	7,000 lbs.
Useful Load	2,200 lbs.	2,670 lbs.
Range, with 30-minute reserve	1,625 mi.	1,480 mi.
Service Ceiling, 2 engines	22,500 ft.	24,200 ft.
Ceiling, one engine	8,000 ft.	15,000 ft.
Rate of Climb, S/L	1,450 ft/m	1,600 ft/m

short-field performance

Actually, Aero Commanders are operating daily out of small sod fields all over the country. Timber men in the Northwest, oil operators on the plains and sand beaches, construction men at remote job sites—all give testimony to the versatility of this executive transport. The take-off and landing figures above are based on a full gas load.

The choice of men at the top
Kings·Presidents·Executives

AERO Commander
560-E · 680-S

*Aero Commander Intelligence Quotient - one of a series

AERO DESIGN & ENGINEERING CO
TULAKES AIRPORT • P. O. BOX 118 • BETHANY, OKLAHOMA

CONVAIR 880: World's Fastest Jet Passenger Plane!

Racing with the sun at 615 miles an hour, Convair's 880 Jet-Liner will cut your travel time in half! The only jet transport designed to operate from hundreds of existing airports, it will bring silent, vibrationless flight to travelers everywhere . . . big cities and small.

Convair's 880 Jet-Liner, powered by General Electric CJ-805 engines, will be delivered to leading airlines* for world-wide service beginning in 1959. In this new era of jet transportation, Convair's luxurious 880 Jet-Liner will be the world's fastest passenger plane—truly master of the skies!

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

*AMONG AIRLINES TO FIRST OFFER CONVAIR 880 JET-LINER SERVICE WILL BE TWA • Delta • TRANSCONTINENTAL S.A. (Argentina)